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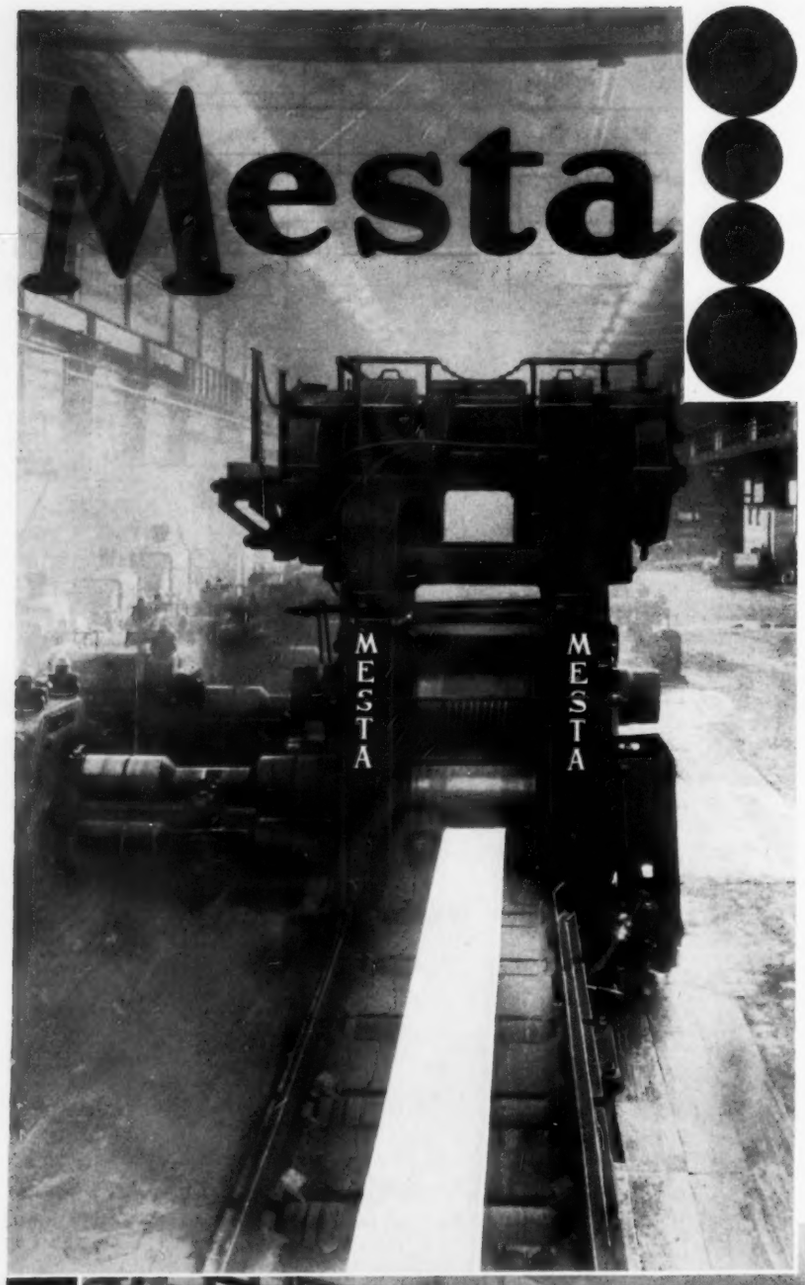

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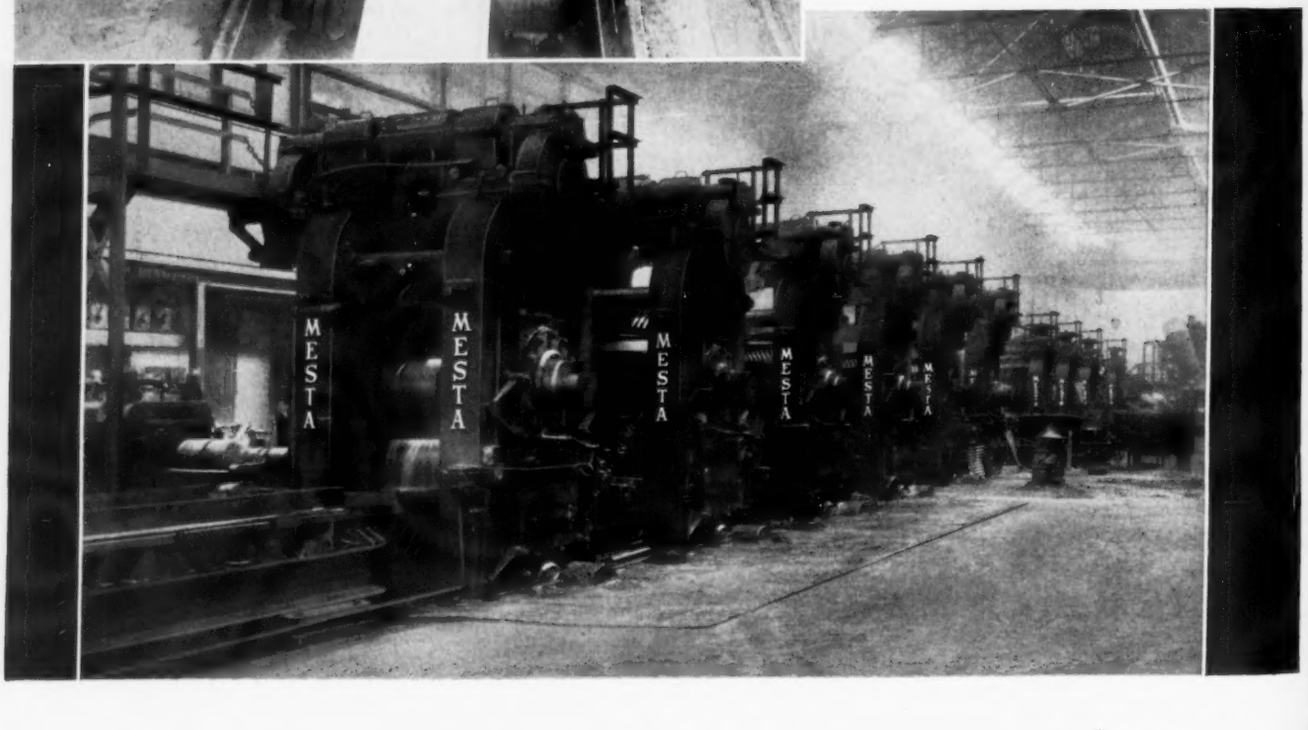

Volume 90 Number 24

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

IN STRIKING at its unseen but hurtful enemy —depression—the industry is fired with the zeal of nationalism. On the spur of the American Iron and Steel institute, the customs service is launching an investigation into alleged dumping from France, Belgium, Luxemburg and Germany of practically every steel product made in those countries (p. 13). Already on the docket of the customs service are charges of dumping of pig iron and hoops from England, Belgium and Holland. . . . From the scrap industry, not usually cloaked with an international aspect, comes moral support in the form of insistence upon an embargo on all imports, it being contended (p. 13) that the equivalent use of domestic steel in 1931 would have put 25,000 additional men on alligator shears and torches.

Fighting Spirit Now Industry's Chief Asset

Attempting to shut the door on Europe gives vent to a praiseworthy fighting spirit, but it may place an inflated value upon the domestic market. Despite a moderately good aggregate showing by the automobile industry and continued substantial bookings of structural business, current steel requirements do not support an operating rate of more than 17 per cent (p. 49). . . . This foreshadows in June an output of steel ingots even lower than the 42,593 gross tons daily rate and 20.11 per cent operating ratio of May (p. 15), which undercut every month in modern steelmaking save the extreme low of 1921. Production has broken through all previous resistance points, but that the country cannot long subsist on such short steel rations producers are confident.

Even Continuous Mills Become Competitive

One condition for restoring confidence to business —the tax bill—has been fulfilled without any visible improvement, emphasizing that so long as congress remains in session it is an unsettling factor (p. 19). But, technically, the industry is girding for the long pull. At Youngstown last week, before foreign and American engineers, hot rolling of strip steel by the Steckel method was demonstrated (p. 33) on a 4-high type mill. By this development in rolling practice the slab is broken down, the hot strip alternately coiled and re-coiled in gas-fired holding furnaces while being pressure and tension rolled, at a speed of 300 feet per minute in this installation and a promise of 900 in the next.

Gives Impetus to Stainless Steel in Building

A far-reaching gesture by the United States Steel Corp. with an important bearing on the structural market is its acquisition of rights to the Budd system of stainless steel construction and the Budd shot-welding process (p. 11).

A signature that cannot be forged. J. C. Lincoln, president, Lincoln Electric Co., using an arc welding electrode to sign checks of prize winners in Lincoln contest. Details on page 30

Thereby stainless steel of the 18-8 type can be welded as successfully as carbon steel, and because the process makes a corona-free weld the last barrier to stainless in the structural field is lowered. . . . For the fourth consecutive week demand for structural steel leads all products (p. 41), over 107,000 tons being booked in that period. Eastern fabricators look to a Pennsylvania release to revivify their shops.

Steel, Gas and Electricity in Triple Play

Public utilities and steelworks in the Chicago district report mutual advantage in an exchange system whereby the steel plants purchase their electric power from the electric utility and sell their surplus coke oven gas to the gas utility (p. 22). By underfiring their coke ovens with blast furnace gas, steelmakers are able to release much of their coke oven gas. In normal times, the six Chicago steelworks daily purchase about 38,600 kilowatts of electric power and market 90,000,000 cubic feet of gas. . . . It is in the electric industry that the Swope plan of unemployment insurance is finding its first application (p. 17). Ultimately, 200,000 in this industry will be thus protected.

At Last, the Forger's Nemesis

Checks of ⅛-inch steel sheets, 10x24 inches, signed with the electric arc, are conveying the prize money to the top three in the Lincoln arc welding prize competition (pp. 9, 30). After endorsement, also by the electric arc, and returned to the bank of issue these steel checks will be canceled by machine gun fire. Incidentally, first and second prizes go to navy and army officers. . . . An increase of 50 to 60 per cent in speed and a reduction of 25 to 30 per cent in cost is claimed for welding by a multiflame blowpipe (p. 36). . . . Resistance welders are being used successfully for heating pipe and structural shapes which must be bent for unusual service (p. 35) in electric locomotives.

Preformed Sheets for New Type Steel Floor

Maximum load-carrying ability, permanent flexibility for floor ducts, and protection against fire are provided by a steel floor made from preformed sheets, No. 14 or 16 gage, 24 inches wide and about 12 feet long (p. 28). Each member consists of four keystone-shaped corrugations in top and bottom sheets, the two being welded together in a plane above the neutral axis. An alternative design is a flat top sheet welded to the lower formed sheet. . . . Uniform pickling of sheets and strip with less danger of pitting, burning or wasting is obtained (p. 36) by the use of larger tanks which permit lower temperature, lower acid strength, longer pickling time.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

To the Editor:

Slowly at first, as the engineer of a giant Mogul skilfully applies the engine's power to start moving a heavy train, so too, the inherent energy and genius of American business men soon will be applied to the task of setting in motion the wheels of American industry. Their action awaits only the conclusion of the deliberations of the congress now in session and the enactment of the new laws affecting business.

With a clear view of the road before it, and a knowledge of the per cent of the grade, American industry will immediately start the climb, and with ever increasing momentum surmount any obstacles that may confront it.

Since the congress unquestionably will enact laws now under discussion before the end of June, we are firmly convinced that the time is here for business men to pursue the far-sighted policy of laying plans for strengthening sales organizations and sales policies; for effectively coordinating present and future sales and advertising activities. Then no time will be lost when industry, two or three months from now, starts its upward climb to complete recovery; no undue advantage will be gained by competitors of courage and vision.

W. L. RICKARD, President
Rickard & Co., Inc., New York.

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To the Editor:

How long must we—can we—will we stand for political injustice?

We have county commissioners refusing to reduce salaries or to adopt economical business methods. We have senators and representatives resisting salary cuts for themselves or for others. We have a Couzens shouting for higher taxes for the rich with his own fortune invested in tax free securities. We have a Borah shouting for billions in bonds to relieve the poor and a La Guardia shouting "tax the rich" when all of us who have learned anything know that if the rich have to pay all their excess income in taxes they have nothing left for reinvestment.

Let's quit trying to dodge our fair share of necessary government expense. It is better to accept our share and quit trying to soak some other fellow. In the meantime let us insist that government practice real genuine economy.

Let's do this quickly and adjourn congress so business will know the worst and be able to settle down to the task of making the best of things as they are.

F. W. JESSOP
Cleveland

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To the Editor:

On page 15 of your issue of May 9, in reporting the proceedings of the American Foundrymen's association, you quote me as saying "alloy steels now have taken the place once filled exclusively by manganese steel."

To one not familiar with the facts this would sound as if I had stated that manganese steel has now been largely replaced by other alloy steels, which is far from being the case. What I did say was that for some types of service involving pure abrasion, such as brick and clay working machinery, manganese steel in this country has been largely replaced by harder alloy steels and irons.

JOHN HOWE HALL,
Technical Assistant to the President,
Taylor-Wharton Iron & Steel Co.,
High Bridge, N. J.

Budd Grants U. S. Steel Rights To Shot-Welding Process

NEW YORK — The United States Steel Corp., has negotiated a contract with the Edward G. Budd Mfg. Co., Philadelphia, whereby it has acquired rights to the latter company's system of stainless steel construction including the shot-welding process for the use of its subsidiaries in the construction of ships, bridges and structural elements in building.

This follows closely an announcement of the Budd company within the last week that rights to use its shot-weld system of stainless steel construction in Italy and Spain have been granted to the Societa Idrovolanti Alta Italia "Savoia" of Milan, Italy. The welding process will be applied to all Savoia-Marchetti airplanes.

The shot-welding process was developed by the Budd company for the fabrication of the 18-8 type of stainless steel which contains 18 per cent chromium, 8 per cent nickel and less than 0.18 per cent carbon. This steel has superior corrosion resisting properties imparted by a heat treatment consisting of cooling it from some 1900 to 2000 degrees Fahr. Unlike ordinary steel, it can be welded only when special precautions are taken. Conventional welding methods produce localized precipitation of carbides which impairs corrosion resistance.

High Current Essential

The first comprehensive explanation of Budd welding process was incorporated in a paper on "Stainless Steel in Aircraft Construction," prepared by Col. E. J. W. Ragsdale, research engineer of the Budd company, and presented at a meeting of the American Society of Mechanical Engineers in Buffalo, June 6.

Outstanding features of the spot welding machine, according to Colonel Ragsdale, are absolute uniformity of current supply; use of high currents in a very brief, controllable time element; and a recorder which supplies visible and audible record of performance. Results seem to justify differentiation, and the term "shot welding" has been coined.

With the use of the shot welder, corona-free welds can be made consistently, which automatically opens up a large structural field to stainless steel. The first use of stainless steel was in connection with aircraft which, at the same time, was conceived as its severest test. Development, extending over years, has been gradual and cautious, and not until the fall of 1931 did a completed airplane result. (See STEEL, Nov. 30, 1931, pages 15 and 19). This, an amphibion patterned after Savoia Marchetti design, has since demonstrated its worth in test and flight.

In shot or spot welding, the diameter of the fused slug should have some reasonable relation to the thickness of the sheets to be joined. No closed section can economically suffer large welding flanges, for it is here that compression failure initiates. Shot welding encourages use of a narrow flange — much narrower than would obtain in a riveted connection—and, in consequence a spot not greater in diameter than three times the double thickness of material should be used. The flange, in turn, should be at least three spot diameters in width.

Avoid Corona Effect

It will be appreciated that a large corona effect would reach the edge of the flange, where, experience shows, all fatigue failures start. A corona-free spot is essential, and such is obtained by short time of current dwell. There is really no need for large areas of fusion, since good welds will show twice the shear of rivets of like diameter and can be spaced 50 per cent closer together.

Shear is not the only test for welds; the welds must be tough — tough enough to permit rotation through at least 60 degrees. Again, current and time relation will determine the character of the fused slug.

Pressure on electrodal points is not significant except in two cases. There must be sufficient pressure to insure good point contact and a sufficient pressure of electrodes, or adjacent clamps, to bring the flanges closely together. Otherwise, the current diffuses over a circuitous path, and stainless being highly resistant, the amperage is reduced. The weld recorder must be relied upon to signal such event since the surface effect may be normal.

In this respect, practice is at variance with that of ordinary sheet steel where excessive pressure can result in no weld—just as can too little.

Equipment Is Portable

Probably the one outstanding essential of a shot-welder designed for aircraft or other structural use is portability. It is rarely practical to progress the work past the apparatus. In the Budd machine, long lines of cables attach to hand or air tongs and these are dragged into almost inaccessible places. The machine can be rolled about the floor or lifted by cranes to any desired position. But, the current loss in cables and tongs is substantial and must be compensated for. Test welds made under each and every condition of use are alone determining.

Since the current and dwell are established by the machine, the operator has no choice in these matters. The inspector usually makes the settings for test welds and then adjusts the recorder to the new value. Any variance of conditions which may make for over or insufficient current-time relation causes a bell to

THE GARY OF SIBERIA: General view of Kuznetsk, on the border of Mongolia, where the Freyn Engineering Co., Chicago, has been constructing a plant for the Eastern Steel Combine. The first blast furnace was blown in April 1. Altogether, there will be four blast furnaces, 15 open-hearth furnaces, two blooming mills, rail and structural mill, billet, merchant and bar mills, and a power house and maintenance shops. Photo is by Soyuzphoto to Economic Review of Soviet Union

ring continuously until the machine is reset.

Every weld made or failed is recorded on a tape, the length of line being a function of the I^2Rt; in which I represents amperes, R the resistance, and t the time of dwell. This is the total heating value of the electric energy supplied. It is interesting to note that the heat which actually goes into a single shot weld in two pieces of 0.012-inch material is but 0.035 B.t.u. This also explains how assemblies can be made without that distortion so troublesome in gas welding.

While normal practice is to use two electrodes (one directly opposite the other, and both of similar shape) unusual conditions often dictate welding by indirection. One electrode may consist of a pad clamped to a sheet while the other is conveniently pointed and held against the member to be welded to that sheet.

Again, both electrodes may be pointed and held against the member some distance apart, while a copper plate rests beneath the sheet. Here, two welds are made simultaneously, the current passing from one point through member and sheet into the copper plate, then along the copper plate until it comes opposite to the other point where it exists through sheet and member. This is made possible by virtue of the superior conductivity of the plate over that of the combined sheet and member of steel.

Methods Are Combined

Both methods find application in shot welding a corrugated member to a flat sheet such as is used in flooring or partitions. The sheet rests on a large copper plate and the only care is that electrodes are held far enough apart to insure sufficient resistance in the steel pieces.

Any of the many forms of indirect welding are apt to be more uncertain than in conventional practice. Both care and control must be exercised throughout the operation. Even then, good design will obviate the condition where the structure is important.

Welding through several thicknesses is possible, and frequently done; nor do the pieces have to be of equal gage.

The diameter of the spot is determined largely by current and time rather than by the size of the electrodes. Naturally, however, the spot cannot exceed in area that of the point.

So far, Elkonite has proven to be the most satisfactory tip material. A small piece is brazed to the point of each electride—the smaller, the better, for Elkonite is a copper-tungsten alloy and has much reduced electrical conductivity. If tips are once well dressed they will last much longer. The arcing due to poor contact destroys them quicker than wear or deformation. Much prejudice exists with relation to the shape of the points, flat, conical or ball peened, with little convincing evidence. Where rapid welding is done on automatic machines, the electrodes should be water cooled.

Shot welding is a quick and inexpensive form of attachment. One operator can average 10 welds a minute on complicated work and 40 on fairly straight seams. Machine welding has no apparent limit. Using only one pair of points, 100 welds per minute have been done consistently.

The Business Week In Washington

CONTRARY to expectation when the sales tax was included in the first draft of the revenue bill, new federal taxes will not have a direct incidence upon the iron and steel industry. With other industries it will pay increased corporation taxes, 2 cents on every bank check, the increase in postage and other levies, but nothing as direct as the sales tax.

The tax on automobiles and trucks, telephone and telegraph messages and import taxes on lumber, copper, coal and oil become effective June 21. The new postal rates are effective July 6. Altogether, the bill signed by President Hoover June 6 is calculated to net the government $1,118,500,000 per year.

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While the house has passed the Garner relief bill appropriating more than $3,200,000,000, chiefly for post-office and other federal construction, it is believed that the senate will submit a substitute more in accord with President Hoover's relief policy.

The policy would give authority to the Reconstruction Finance Corp. to increase its securities to $3,000,000,000 to enable it to make loans to states and to the federal farm board for relending to farm co-operatives.

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Interstate commerce commission has decided that the carload freight rates on iron and steel articles between points in Illinois and Keokuk, Iowa, are not unreasonable.

Studies Bar Pooling Plan

Concrete Reinforcing Steel institute, Chicago, has begun its survey of warehouse costs in a prominent center where obviously too many warehouses are competing for the small tonnage now available. This survey is being made to ascertain if sizable economies can be effected if this tonnage were concentrated in one or two warehouses operated for the joint account of the members in that area. Trucking costs will also be studied for the same purpose.

Close on Cupola for Guam

New York—Bids close June 14 with the bureau of supplies and accounts, navy department for one foundry cupola, ½ to 1-ton capacity, delivery at Mare Island, Calif., for trans-shipment to the naval station at Guam, M. I. The cupola, with firebrick lining complete and adapted for general foundry work, will have a shell diameter of 32 inches, diameter of air chamber, 46 inches; diameter inside lining, 23 inches, and thickness of steel shell plates, 3/16 and ⅛ inches. Height overall will be 60 feet and distance from the floor to the charging platform 16 feet.

Seek Better Steel Harbors

Pittsburgh—American Bridge Co., Pittsburgh, is applying for federal permission to improve its harbor and launching ways at Ambridge, Pa. The company expects to dredge about 6000 cubic yards of material. Wheeling Steel Corp., Wheeling, W. Va., likewise is asking permission to dredge a harbor to improve landing facilities at its Steubenville, O., plant.

Cuts Company Service Fees

House and garage rentals, hospital fees and other items of company service will be lowered by the Colorado Fuel & Iron Co., Denver and Pueblo, Colo., beginning June 16. Every item pertaining to house rentals will be reduced 15 per cent. The hospital fee will be $1.25 per day, down 25 cents. About 10,000 employes in Colorado and Wyoming will benefit.

100 Tons in Electric Sign

Philadelphia — Largest electric sign in this vicinity, above the Philadelphia Saving Fund Society building, entails about 100 tons of structural steel. It is 34 stories or 525 feet above street level; its letters are 15 feet x 25 feet 8 inches. Morris Wheeler & Co. Inc. fabricated the steel for the general contractor, the George A. Fuller Co.

Corp. Exhibits at Chicago

Subsidiary companies of the United States Steel Corp. have contracted for

space at the Century of Progress exposition in Chicago in 1933. D. A. Merriman, vice president and general manager of sales, American Steel & Wire Co., Chicago, is vice chairman of the corporation committee in charge of installation and maintenance.

Financial News of Steel Industry

CLIFFS CORP., Cleveland, in 1931 set up a reserve of $50,000,000 against stock of the Cleveland-Cliffs Iron Co. and other securities owned by the former corporation. Cash is shown as $720,000, notes receivable at $352,000. Total assets are put at $32,000,000, bank indebtedness $1,607,000, and capital surplus is reduced from $56,535,320 to $5,540,000.

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Pittsburgh Steel Co., Pittsburgh, through the Union Trust Co., Pittsburgh, will receive tenders on or before June 20 for $250,267 of 20-year 6 per cent sinking fund debenture gold bonds dated Feb. 1, 1928.

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Youngstown Sheet & Tube Co., Youngstown, O., has omitted the quarterly dividend of $1.37½ on the preferred stock due at this time.

Russia Plans Continuous Mill at Dnieprostroy

Cincinnati—That Soviet Russia is now planning a $20,000,000 installation, to include a slab mill, two plate mills and a strip mill, at Dnieprostroy, was disclosed here when Robert A. Solborg, European manager of the Armco International Corp., told of negotiations by the Soviets for a license to use the continuous rolling process of The American Rolling Mill Co.

Mr. Sorborg, who recently returned from Moscow, told the Foreign Trade club of the chamber of commerce, that American engineers would likely direct the installation and use American machinery chiefly.

Navy Takes Valve Bids

New York—Bids close June 14 on 1068 small-sized corrosion resisting steel valves for delivery to the Brooklyn navy yard, including 46 flanged inlet and outlet valves, 38 reducing valves, 376 globe stop, angle stop, angle hose and special angle stop valves, 608 globe stop valves.

Farrell for Economic Planning—But by Industry

Economic planning beyond that which every intelligently managed industry finds it necessary to undertake, is neither feasible nor desirable because it would throttle the American tradition of individual freedom, declared James A. Farrell, retired president of the United States Steel Corp., in delivering the graduation address at Stevens Institute of Technology, Hoboken, N. J., June 4.

Planning can only be done by executives on the spot and not by any government bureau or trade group, Mr. Farrell maintained. Those loudest in their condemnation of mechanization would be first to complain if the motor car, airplane, radio and other benefits of mechanization were to be lost, he charged.

Scrap Institute for Embargo As Dumping Probe Is Opened

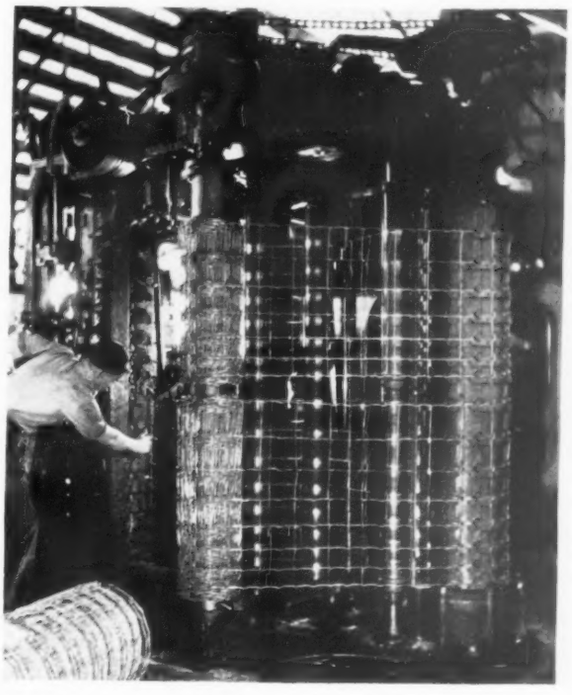
WASHINGTON—An embargo upon imports of iron and steel is being proposed by the Institute of Scrap Iron and Steel Inc., New York, as the customs service of the treasury department is officially launching an investigation into alleged dumping, following the complaint launched June 3 by the American Iron and Steel institute against inroads of foreign steel.

Enough foreign steel was received in 1931 to shut 25,000 employes out of the iron and steel scrap industry, directors of the Scrap institute alleged, June 7, at a special meeting proposing the embargo. The loss in revenue to the railroads in 1931 through a smaller movement of scrap, directly traceable to imports, is estimated at $250,000.

Representatives of the customs service in the United States have been directed to submit informative data on imports of iron and steel, with special bearing on price. Somewhat similar data will be sought in the countries named in the complaint—France, Germany, Belgium and Luxemburg.

Then will follow a tabulation of these data and presumably hearings at which both importers and domestic producers will have their innings. Such an investigation, the customs service points out, will probably require "many months."

The June 3 complaint of the Iron and Steel institute is based upon imports allegedly below the cost of production abroad and embraces practically all finished products. Prior, the Institute had complained against alleged dumping of hoops from Belgium and Holland. Dumping of pig iron from England and Holland has been charged by interests at Port Henry, N. Y.



On this noisy, ponderous loom nimble steelworkers weave fencing to protect farmers' flocks in all parts of the world. It is said that the fence this mill has produced would encircle the globe six times. Photo by Eugene Hutchinson, Chicago, at works of Colorado Fuel & Iron Co.

Personals » » »

LEW E. WALLACE has been appointed district sales manager for the Youngstown Sheet & Tube Co. with headquarters in New York, effective June 6. Mr. Wallace started in the Cleveland sales offices of the company, later serving in the Detroit, Chicago and home offices of the company. W. B. Blowers, former sales manager at New York, will continue in that office as special representative for the company.

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William J. Sullivan, formerly associated with the office of the president of the United States Steel Corp., can be reached at postoffice box 211, Trinity station, New York.

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Oliver C. Irwin, for many years chief electrician of the mining department of the Colorado Fuel & Iron Co. at Trinidad, Colo., retired June 1 after 25 years of service.

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George A. Singer, formerly with the sales department, Sharon Steel Hoop Co., and later with the Columbia Steel Co., Elyria, O., and its successor, American Rolling Mill Co., has joined the Youngstown Sheet & Tube Co.'s sales force at Cleveland.

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W. H. Donner, former president of the Donner Steel Co., Buffalo, now part of the Republic Steel Corp., has been elected president of the International Cancer Research foundation and has placed at its disposal $2,000,000 for its activities, as a memorial to his late son, Joseph W. Donner.

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D. S. Harder, formerly works manager of the Edward G. Budd Mfg. Co., at Detroit, has been appointed works manager in charge of production of the Budd plants in Philadelphia and Detroit, with headquarters in Philadelphia.

LeRoy A. Coleman is production supervisor of the Detroit unit.

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Alden C. Cummins, director of power distribution, has been made assistant general superintendent of the Duquesne steelworks, Carnegie Steel Co., Pittsburgh, succeeding Davis C. Burroughs, who resigned in January. Mr. Cummins, a 1910 graduate of Lehigh university, went with Carnegie in 1911, and recently has been in charge of all interworks electrical transmission in the Monongahela valley. He was president of the Association of Iron and Steel Electrical Engineers in 1925, and now is chairman of the Pittsburgh division.

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A. T. DeForest, retiring president of the Columbia Steel Co., San Francisco, was honor guest June 2 at a testimonial dinner given by more than fifty executives of steel distributing concerns, including reinforcing bar jobbers, in northern California. Frank Baker, of the George H. Tay Co., San Francisco, was toastmaster. Speakers included W. B. Simpson, of the A. M. Castle Co., Chicago; Arnold Foster, sales agent, Pacific Coast Steel Corp., San Francisco, and Harry L. Simon, of Foucar, Ray & Simon, San Francisco. Mr. DeForest was presented with an antique Thibetan Buddha.

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George W. Burrell, president, Wellman Engineering Co., Cleveland, received the professional degree of mechanical engineer from Ohio State university, Columbus, June 13. Mr. Burrell, who is 61, entered the employ of the Cleveland Rolling Mill Co., Cleveland, when 16, serving three years as apprentice machinist, following which he worked one year as a journeyman machinist. In 1891 he entered Ohio State university, studying three years.

Kaiden-Keystone Studios

George W. Burrell

Then followed connections with the Rolling Mill company, the Consolidated Steel & Wire Co. at Rankin, Pa., and the Ironton Structural Steel Co. Here, as master mechanic under Henry Grey, superintendent, he assisted in development of the Grey wide-flanged beam, later known as the Bethlehem type I beam. In 1898 Mr. Burrell began an association with the Wellman company, which led to the presidency—which he still retains—in 1928.

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J. H. Fitch Jr., former vice president in charge of sales of the Newton Steel Co., Detroit, has been appointed district sales manager for the Inland Steel Co., Chicago, in the Detroit district, with headquarters at 1118 Fisher building.

Obituaries

ROBERT M. KEENEY, 48, president of Pittsburgh Crucible Steel Co., Pittsburgh, and vice president and director of the Crucible Steel Co. of America, New York, died at Pittsburgh, June 5. He was also a director of the Snyder Mining Co. Mr. Keeney was born in Warsaw, N. Y., and attended Phillips-Exeter academy and Cornell university. For the past ten years he had been with the Pittsburgh Crucible Steel Co. as general superintendent and president. Previously he was successively connected with the Illinois Steel Co., New York State Steel Co., Jones & Laughlin Steel Corp., Atlantic Steel Co., Whitaker-Glessner Steel Co. and the Central Iron & Steel Co. He was recognized as one of the ablest of the younger executives of the steel industry.

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W. P. Murray, 57, a director of the Burlington Steel Co. Ltd., Hamilton, Ont., died at his home in Toronto, Ont., June 5.

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Thomas Corrigan, special agent on steel sheet sales for the Youngstown Sheet & Tube Co. in the Detroit district for half a dozen years, was found dead from heart failure June 8. He was about 65 years old and was widely known in the sheet steel industry. For years he had been with the American Rolling Mill Co., later with the Central Alloy Steel Co., when he resided at Canton, O., and for the past several years was with the Detroit sales office of the Sheet & Tube.

□ □ □

Albert L. Cromlish, general superintendent of the Duquesne plant, Carnegie Steel Co., Pittsburgh, died June 9. A graduate of Pennsylvania State college, he entered the service of the Bessemer & Lake Erie railroad during his vacations of 1895 and 1896. In 1897 he became chemist for the Shenango Valley Steel Co., New Castle, Pa. After two years he became chemist for the Carnegie company at Niles, O. Subsequently he was associated with the Carnegie company at its Farrell, Donora and Edith furnaces, becoming general superintendent at Farrell in 1920 and remaining until going to Duquesne May 15, 1931.

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C. C. Hobart, 78, a founder of the Hobart Mfg. Co., Troy, O., which was one of the first companies organized

to manufacture dynamos and motors, died June 3.

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Louis N. Stieglitz, 77, president Stieglitz-Treiber Co., New York, dealer in sheet steel, died June 5.

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William L. Loeser, 64, president of W. L. Loeser Inc., waste material dealer, Buffalo, died there May 30.

□ □ □

J. B. Harring, chairman of the Ottawa Silica Co., Ottawa, Ill., died in Pasadena, Calif., May 31.

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Robert D. Mahaffey, vice president and treasurer, American Well Works, Aurora, Ill., died June 3. He was 65.

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Charles Reese, 62, for many years superintendent of the armor plate department, Bethlehem Steel Co., Bethlehem, Pa., died June 5.

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Oscar K. Davis, 66, secretary since 1917 of the National Foreign Trade council, New York, died June 3 at Bronxville, N. Y.

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Frederic S. Overton, secretary and director, Ingersoll-Rand Co., New York, died June 4.

□ □ □

John M. Brown, 76, president and one of the founders of the Brown-Boggs Foundry & Machine Co. Ltd., Hamilton, Ont., died June 3.

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Albert B. Shultz, 56, former president of the Houde Shock Absorber Co., Buffalo, who retired in 1928, died June 3.

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J. H. Maguire, 50, associated with Grant Smith & Co. in many important western railroad construction projects, died May 29 at Seattle.

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Arnold J. Holzer, 49, vice president of the Holzer Sheet Metal Works and Orleans Steel Products Co., New Orleans, died May 23.

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Joseph C. Bolter, 72, for more than 50 years associated with A. Bolters Sons, Chicago, structural steel fabricators, died at his home in that city, June 5.

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James A. McDonald, 59, assistant to the president, Standard Sanitary Mfg. Co., Pittsburgh, died at Bellevue, Pa., June 4. He had been associated with the company for more than 40 years.

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Augustus D. Ledoux, 65, president of the Pyrites Co. Ltd., New York, and well known to the iron and steel industry for his service on the American Iron and Steel institute ferroalloys committee during the war, died June 5 at New York.

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Luther D. Burlingame, 76 industrial superintendent, Brown & Sharpe Mfg. Co., Providence, R. I., died in that city June 2. A native of Whitesboro, N. Y., Mr. Burlingame had been a resident of Providence many years and active in civic affairs. He was president of the Providence Safety council and a former president of the Providence Engineering society.

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Sir Dorabji Jamsetji Tata, chairman of the Tata Iron & Steel Works, Sakchi, India, and regarded as the founder of the iron and steel industry in India, died in a sanitarium in Bavaria, June 3. A graduate of Cambridge University in England, he endowed engineering laboratories there, created and endowed the Indian Institute of Science, and among the enterprises originated or conducted by him in India are cement works, power stations, blast furnaces, structural steel shops and spinning and weaving mills. Sir Dorabji was 71.

Steel Ingot Output in May Continues Steady Down Trend

FURTHER decline in production of steel ingots in May brought the daily rate to 42,593 tons, the lowest for any month since July, 1921, when it was 36,713 tons, the low point of the decline of that year. The per cent of operation in May was 20.11, the lowest of the present decline. The daily rate of production in April was 47,685 tons and the rate of operation was 22.52. In May, 1931, the corresponding figures were 96,365 tons and 45.36 per cent.

Total production in May was 1,107,424 tons and for five months, 6,678,902 tons. This compares with 1,239,811 tons in April, this year, 2,505,485 tons in May, 1931, and 13,182,609 tons, five months, 1931.

Statistics of production by the American Iron and Steel Institute show the level of May, 1932, is slightly below half that of May, 1931, in tonnage and percentage of capacity employed, and the same ratio is practically true for the five months of these two years.

The loss of operating activity from April to May was 2.41 points, which is equivalent to 10.65 per cent of the rate for April. This compares with a decline of 8.3 per cent in the production of pig iron in May compared with April, as presented in STEEL for June 6, page 16.

Steel Ingot Production — 1931-32

95.21 Per Cent of Industry Reporting
Gross Tons

1931	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	No. of working days	Approximate daily output all companies	Per cent operation
Jan.	2,044,298	296,620	2,340,918	2,458,689	27	91,063	42.86
Feb.	2,085,529	296,974	2,382,503	2,502,366	24	104,265	49.08
Mar.	2,504,060	346,137	2,850,197	2,993,590	26	115,138	54.20
Apr.	2,275,404	316,668	2,592,072	2,722,479	26	104,711	49.29
May	2,083,833	301,639	2,385,472	2,505,485	26	96,365	45.36
5 mo.	10,993,124	1,558,038	12,551,162	13,182,609	129	102,191	48.10
June	1,730,109	246,365	1,976,474	2,075,910	26	79,843	37.58
July	1,570,776	225,030	1,795,806	1,886,153	26	72,544	34.15
Aug.	1,462,469	174,631	1,637,100	1,719,462	26	66,133	31.13
Sept.	1,274,321	199,151	1,473,472	1,547,602	26	59,523	28.02
Oct.	1,320,158	195,943	1,561,101	1,592,376	27	58,977	27.76
Nov.	1,276,906	240,441	1,517,347	1,593,684	25	63,747	30.01
Dec.	1,069,468	170,546	1,240,014	1,302,399	26	50,092	23.58
Total	20,697,582	3,009,894	23,707,476	24,900,195	311	80,065	37.69
1932							
Jan.	1,230,661	160,633	1,391,294	1,461,290	26	56,203	26.54
Feb.	1,232,568	157,067	1,389,635	1,459,547	25	58,382	27.57
Mar.	1,149,307	193,944	1,343,251	1,410,830	27	52,253	24.68
Apr.	1,036,227	144,197	1,180,424	1,239,811	26	47,685	22.52
May	950,785	103,593	1,054,378	1,107,424	26	42,593	20.11
5 mo.	5,599,548	759,434	6,358,982	6,678,902	130	51,376	24.26

Figures exclude crucible and electric ingots. Operating percentages for 1930 are based on capacity of 62,265,670 gross tons as of Dec. 31, 1929; for 1931 on capacity of 66,069,570 gross tons as of Dec. 31, 1930.

MIRRORS OF MOTORDOM

DETROIT

WILLYS is designing a light car, to weigh slightly under 2000 pounds and presumably to be priced in proportion, which promises a further complication in the already highly-competitive low-price field.

The new Willys, now on the drafting board, would be practically midway between the bantam class, as typified by the American Austin, and the average of what is regarded as the low-price group. It would be only 100 pounds or so heavier than the old Ford Model T.

The American Austin weighs 1150 pounds. The light car Ford is making in England stands at about 1600 pounds. In the sedan model the present Willys six weighs 2800 pounds, Ford four 2360, Ford eight 2450, Chevrolet 2770 and Plymouth 2875.

Detroit never has been enthusiastic over extremely light cars. The plans of Willys may be contingent upon whatever changes in management occur July 1 when John N. Willys resumes control. Fresh from his ambassadorship to Poland, Mr. Willys himself may have returned with certain ideas concerning the light cars so popular abroad.

Ford, G.M.C. Have Light Cars

But in case Willys proceeds with its plans and scores a hit—the presumption being that the price would be lower than $400—Ford has its English model, first units of which were assembled at the Rouge plant and shipped abroad, which might be adapted for the American market.

General Motors is manufacturing in Germany, partially on machinery exported from the Buick plant at Flint, its Opel model, which falls in the same weight category as the proposed Willys and the English Ford. There have, in fact, been some rumors that General Motors would build a duplicate of Opel in the Pontiac plant.

However, there is a growing belief in Detroit that in his new four Ford has the bellwether of the competition in the extreme low-price field. Some maintain that Ford has never utilized to the fullest his price advantage, and that the four now is an ace in the hole. While the eight is the more spectacular performer, the four has achieved sales surprising even to Ford officials; at present its output is slightly over one-half of the Ford total.

Hudson, Dodge Fours Soon

Although the competition in the $400 or less class is about to tighten, there is a little more doubt whether General Motors will join the issue immediately. One opinion within the Corporation is that its fire might better be held until the retail market is more propitious, that if present models are not moving fast neither would any radical new ones.

Hudson-Essex, however, is apparently moving to a conclusion with its new small car, which probably will carry a name not before used by this manufacturer. The new small four which the Chrysler organization has been developing will be brought out by Dodge, it now appears, instead of by DeSoto.

The tactics of General Motors at this time seem to pivot upon a concentration of manufacturing and a redesign for the 1933 models which will sharply differentiate the various lines, especially Buick, Olds and Pontiac. Some dies have been ordered for the 1933 Buick, for delivery Oct. 1, which would indicate no change in models until the year end. It is believed that the Buick engine will be redesigned for the use of alloy steels not favored by the former management and that the size of many sections will be reduced.

With its sharp price reductions, Auburn invades a field heretofore below it in price. Plans for new models are said to have been shelved for an essay into merchandising calculated to determine whether so low a price for so much bulk in car would attract buyers. The Auburn policy is one more warning to sources of supply to the automobile industry that the pressure on price will be intensified.

Some observers believe they detect a slightly more cautious policy on the part of Ford. While production is being increased and the recent distribution of steel products and parts was the largest at the Rouge plant since the middle of 1931, further expansion apparently will be tempered somewhat to spread production as far as possible into the fall.

The present objective is to attain 5000 units daily, 5 days a week, with assemblies of the eight somewhat larger than those of the four. June output of Ford will not exceed 100,000 by a wide margin. No buyer will be compelled to wait long for his Ford; at the same time production will be held in hand to preserve a comparatively level operation for the benefit of labor.

May 20 Per Cent Over April

May assemblies of cars and trucks in the United States are estimated by the national automobile chamber of commerce at 185,970 units, about a 20 per cent increase over April. This is slightly lower than first calculations, and makes May the best month since August, 1931, instead of July. It does not appear that June output will exceed the 218,959 of last July by a wide margin, if at all. Ford's 100,000 or so units will about be one-half of the month's total. While Ford is expanding, other manufacturers, including Chevrolet and Plymouth, are contracting.

No small grievance is evidenced by Detroit against the revenue bill signed by the President June 6. In 1921 it was the automobile industry that led the country out of depression, but now no division of it has been overlooked as a source of taxation. It appears that the most pa-

triotic thing a man can do is to buy a new car or to run his old one around the block.

In addition to state taxes, the federal government is now to levy 1 cent a gallon on gasoline. Lubricating oil is to be taxed, and every tire, tube, spare part and accessory will carry an impost. On new passenger cars 3 per cent will be assessed, and on trucks 2 per cent. Detroit believes that buyers with deposits on Fords will seek delivery before the added $13 to $18 is assessed, but otherwise looks for no stimulus to buy to anticipate the tax.

Racing is again in the blood of automobile manufacturers. At the Memorial day races at the Indianapolis speedway six stock passenger cars were entered. Hupp finished in fifth place of all entries and first in stock cars. Its 1931 8-cylinder car, with 250 pounds of lead in the frame to meet the requirement of 7¼ pounds of weight for each cubic inch of piston displacement, averaged more than 100 miles an hour, a speed that in any previous year would have won. There is a tendency, also, by manufacturers to enter in their own names, for the sake of publicity.

Here and There in Industry

FREYN ENGINEERING CO., Chicago, is making some changes in its personnel at Leningrad and Kuznetsk, U. S. S. R., where it has contracts with the Soviet for the construction of steelworks. J. C. Hayes Jr. and Vincent W. King sail June 15 enroute to Kuznetsk, the former returning after a vacation from nine months at that plant, during which time the first blast furnace was blown in. J. R. Comstock, blast furnace engineer and metallurgical specialist, and F. E. Clark, open hearth engineer, have gone to Leningrad to join the Freyn organization which furnishes consultation service to the Soviet steel industry. W. S. Orr, rolling mill engineer, N. H. Lagerstrom, tube mill engineer; and L. D. Anderson, mining engineer and sintering specialist, who have been in the U. S. S. R. for one or two years, are returning to the United States. B. L. Jones, roll designer, and S. B. Haarbye, sheet, strip and plate mill engineer, go to Russia late in June. L. E. L. Thomas and Gordon Fox, who have been in Leningrad several years, will remain.

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National Transit Pump & Machine Co. has moved its Pittsburgh office to room 1320 Gulf building, Seventh avenue and Grant street.

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Fort Worth Well Machinery & Supply Co., Fort Worth, Tex., has changed its name to Well Machinery & Supply Co.

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Redman Bearing & Machine Shop, 818 East First place, Tulsa, Okla., has been established by W. S. Redman, formerly with the Gaso Pump & Mfg. Co., Tulsa.

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Ohio Electric Mfg. Co., 5900 Maurice avenue, Cleveland, has appointed C. Sam Swanson, 1616 Kresge building, Detroit, its representative for the sale of its fractional electric motors, 1/50 to 1 horsepower. G. R. Horne will continue to represent the company in the sale of its lifting and separation magnets.

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Greer Steel Co., Dover, O., manufacturer of cold-rolled strip steel, has appointed Hubbell & Sharp, 2817 Laclede avenue, St. Louis, its district representative.

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Portland Die Casting Co., 838 East Burnside street, Portland, Oreg., has been bought by Allen E. Chisholm, who will operate it under the name of Chisholm Die Casting Works.

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Jessop Steel Co., Washington, Pa., has concluded arrangements with Hayes Wheel & Forgings Ltd., Merritton, Ont., for processing of all its steels in Canada.

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Midwest Screw Products Co. recently organized has bought the plant and physical assets of the Western Screw-Products Co., Main and St. George streets, St. Louis. After some plant changes production will be resumed by the new owner.

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Elliott Service Co. Inc., New York, has opened a branch at 729 Seward street, Detroit, as headquarters for its service in Michigan, Indiana, Illinois and Iowa. A. M. Bennet has been added to the Elliott service organization.

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Poole Foundry & Machine Co., Baltimore, manufacturer of flexible coupling, has appointed the Ladd Equipment Co., First National Bank building, Pittsburgh, its district representative for western Pennsylvania, West Virginia and eastern Ohio.

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Philadelphia Quartz Co., Philadelphia, has bought from the Freyn Engineering Co., Chicago, a Freyn design waste heat boiler to reclaim heat released in the manufacture of sodium silicate. This is the third installation of this type of boiler for this company, the other two being at the company's plants at Baltimore and at Berkeley, Calif.

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Allsteel Press Co. Inc., 12015 South Peoria street, Chicago, manufacturer of punch presses, has established a commercial welding department to do jobbing work. Facilities are provided for production of machine and column bases, gang punch attachments, large die sets, jigs, fixtures and machine parts of welded construction.

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Standard Sand & Machine Co., Machinery Hall building, Chicago, has acquired the business of Carol Engineering Inc., including patents and assets and will operate it in conjunction with its own. Standard Sand & Machine products now include the Carol sand muller, as well as Standard sand mixers and continuous roll mixers. S. T. Johnston has been appointed president and W. C. Packard sales manager.

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Babcock & Wilcox Co., New York, has been granted exclusive rights in the United States and Canada for manufacture and sale of automatic pressure circulating and indirect heating system of sulphite cooking developed by the Kimberly-Clark Corp. Alloy material for this use will be produced under the company's metallurgical supervision and fabricated parts will be made at the works at Barberton, O., where induction melting furnaces are operated on alloy steels.

Electrical Manufacturers Adopt Swope Job Plan

National Electrical Manufacturers association, comprising 300 companies, has adopted the unemployment insurance program proposed by Gerard Swope, president, General Electric Co., Schenectady, N. Y. About 200,000 workers ultimately will be protected.

All employes who have served one year and whose full-time annual wages do not exceed $2500 are affected immediately. At least 60 per cent of the workers in any one plant must first give their consent. Each employe must contribute 1 per cent of his actual wage over a period of 5 years, the company matching these contributions.

After two weeks of unemployment, a participating employe receives 50 per cent of his normal earnings, not to exceed $20 a week, for a maximum of 10 weeks in any consecutive 12 months.

EDITORIAL

Merit vs. Reciprocity in Buying and Selling

RECENTLY a small manufacturer, who through many years has established an enviable reputation for the quality of his product, succeeded in interesting a prospective customer almost to the point of ordering several machines. The contemplated purchase was approved by everyone concerned from the operators, foremen and shop superintendent up to the purchasing agent and vice president in charge of operations.

But the manufacturer did not get the business. At the last minute the president of the company overruled the recommendatons of his subordinates and placed the order with a large competitor of the small manufacturer. The reason for the change was that the president was urged by his banker to "favor" the larger manufacturer.

In another case two paint companies were rivals for an order from a large manufacturer of steel products. The operating men and the purchasing agent preferred the paint made by Company A. When the recommendation was submitted for executive approval it was turned down and instructions were issued to buy the paint from Company B. The reason in this instance was that in the previous year Company B had bought more steel products from the company than Company A had purchased.

Contract Awarded on Basis of Hope for Future Business

A fabricator of steel plate construction was in the market for a certain piece of equipment. Three rival equipment manufacturers had submitted bids. A's bid was lowest, but the consensus of opinion among the executives of the fabricator's company was for the acceptance of B's bid, which was slightly higher than the price submitted by A, and lower than C's quotation. While the tenders were being discussed the sales manager pointed out that C probably would be in the market for steel plate work in the near future. The president siezed on this vague possibility as sufficient reason for awarding the order to C, in spite of the fact that C's price was higher and that the executives most directly concerned with the selection of the equipment favored the acceptance of B's bid.

These three illustrations are typical of the extent to which reciprocity has replaced merit in the purchase of material, equipment and supplies. Reciprocal buying and selling is one of the oldest practices in industry. It presents a serious problem even in periods of prosperity. Today, when buying is at low ebb, it introduces numerous discouraging features into a situation that already is charged with unusual difficulties.

Talk to any progressive industrial executive and he will tell you that personally he dislikes the idea of reciprocated trading but that he is forced to indulge in it because "all of my competitors practice it." Now and then a representative of the old school will openly defend "reciprocity." However, in the main, executives would like to discard it if they thought they could do so without loss of business.

Of course the basic idea of reciprocity is not vicious. When values are identical, the awarding of business reciprocally is to be commended. The type of reciprocal buying which is obnoxious is that in which exceptional merit is ignored in order that a past, present or future customer may be favored.

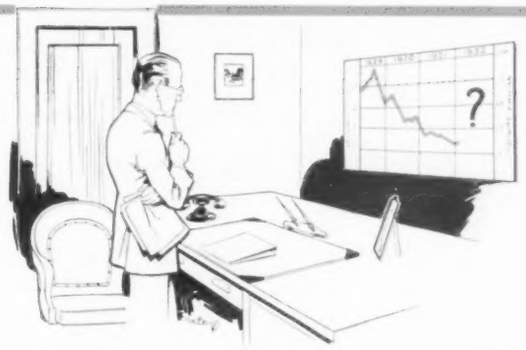
Abuse of Reciprocity Will Die Out When Its Cost Is Recognized

Unfair reciprocal trading gradually will lose its glamor when those who indulge in it find out that it is an expensive luxury. One company went a long way toward discouraging it by establishing a rule that when a purchase is made on the basis of reciprocity, the extra cost over and above that of the lowest bid shall be charged to the department of the person insisting upon the reciprocal arrangement. Under this ruling the sales manager of the plate fabricating company mentioned earlier in this discussion would have had to bear the amount by which C's bid exceeded that of A.

But this covers only a fraction of the cost. Dissatisfaction among works officials who are overruled by front office executives is an important factor. Operation of misfit or inappropriate equipment and use of inferior material or supplies always prove costly. Moreover, reciprocal buying when practiced carelessly may easily take the form of discrimination against small companies. Its effect is more often destructive than constructive.

Reciprocity carried to absurd extremes is costing American industry millions of dollars. If sales managers are willing to add this cost to their sales budgets, well and good! Otherwise the practice should be brought within the bounds of reason.

THE BUSINESS TREND



Menace of Congress Still Is Bar To Recovery

NOT content with having caused the nation losses of billions of dollars through liquidation resulting from several months of needless delay in enacting the tax bill, congress at this writing is utilizing the last few days of the session to make political capital out of the economy and relief bills. Not satisfied with the possibilities of these two urgent issues, many of our congressmen are trying to bring about a last-minute vote on the bonus.

Unless the President again rises in his wrath and swats congress more vigorously than he did before the tax bill was hurried to enactment, the relief and economy bills will be highly unsatisfactory to the nation at large. No one in Washington seems to have even the slightest glimmer of what the nation desires in national economy. Likewise, the Garner bill shows how far astray from the wishes of their constituents the majority of the members of the house have been led.

Unless a radical change in the attitude of congress takes place before adjournment, the country will have to go through the summer under make-shift relief and economy legislation. Fortunately the President will veto bonus action, if such is taken.

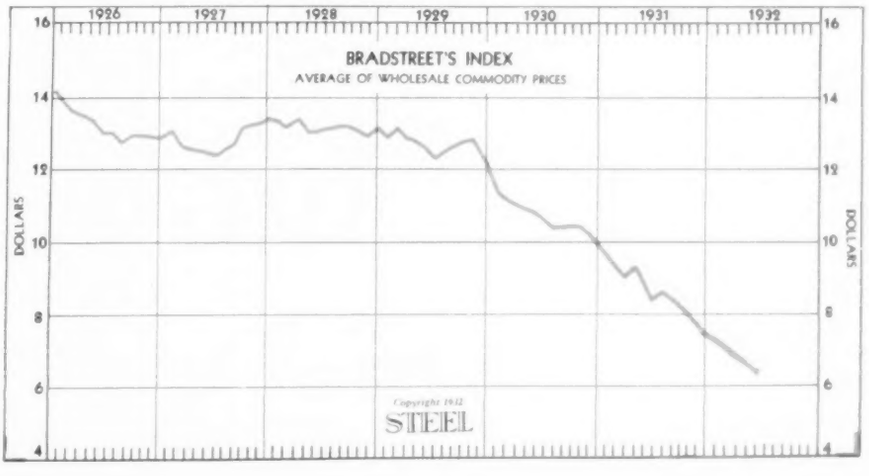
The primary in a midwestern state caused the dethronement of a loud spoken senator who has voted destructively on practically every issue in which the interests of industry were involved. This may be a forerunner of the fates awaiting other demagogues in the house and senate.

Newly Formed Securities Investment Pool Begins Purchase of Bonds

Another favorable sign of the week is the announcement that the American Securities Investing Corp. has entered the bond market. Its task is made more difficult by the renewed incompetence of congress.

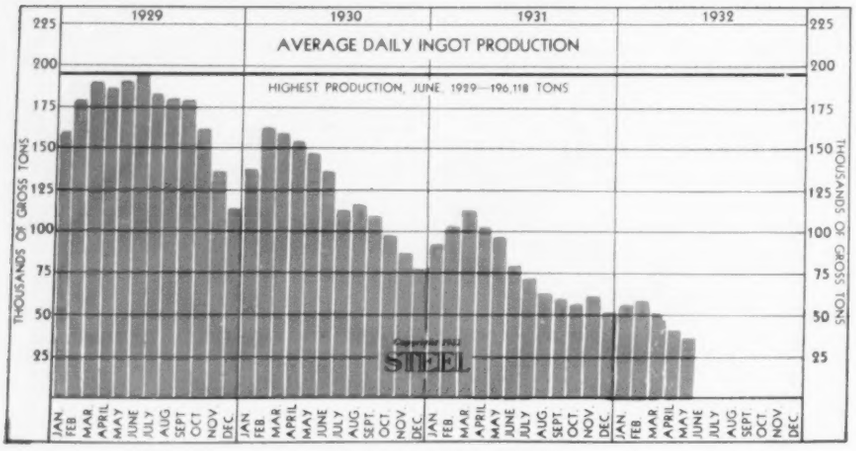
Automobile production in May is estimated at 185,970 units compared with 154,823 in April, a gain of 20 per cent. Car loadings in the week ending May 28 increased 5512 cars from the preceding week.

On the other hand, business in general remains spotty. One cannot escape the fact that confidence will not be restored as long as a recalcitrant congress remains in session.



1932	
June 1	$6.68
May 1	6.91
April 1	7.15
March 1	7.31
Feb. 1	7.52
Jan. 1	7.73

1931	
June 1	$8.64
May 1	8.91
April 1	9.22
March 1	9.16
Feb. 1	9.30
Jan. 1	9.50



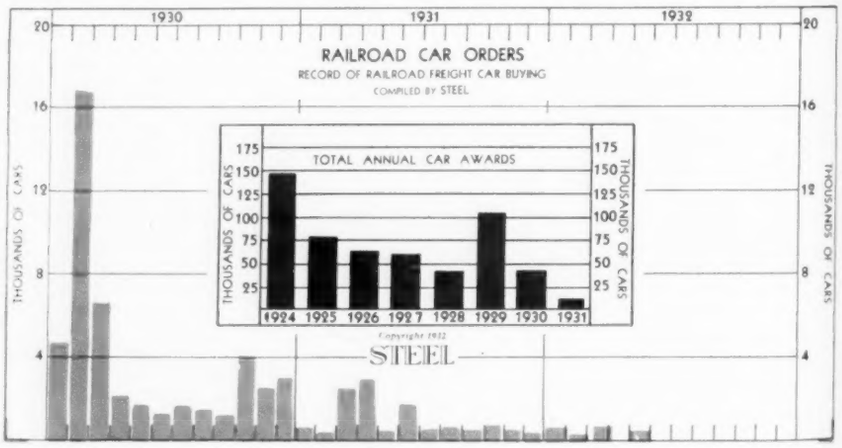
	1932	1931
May	42,593	96,365
April	47,685	104,711
March	52,253	115,138
Feb.	58,382	104,265
Jan.	56,203	91,063
	1931	**1930**
Dec.	50,092	76,136

Steel Ingot Rate Lower in May; Operations 20.11 Per Cent

With an operating rate of 20.11 per cent the average daily output of steel ingots in May amounted to 42,593 tons, a drop of 5,092 tons from the average for April. In May last year the daily output totaled 96,365 gross tons. The approximate daily output of all companies during the first five months of this year was 51,376 tons compared to 102,191 tons in the first five months of 1931. According to the American Iron and Steel institute calculated ingot production by all companies in the first five months of this year was 6,678,902 tons against 13,182,609 tons in the same period of last year, a decline of nearly 50 per cent.

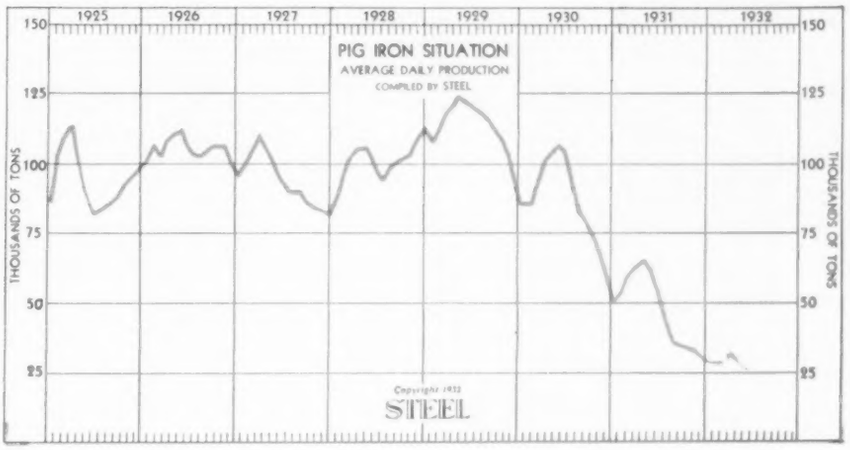
More Freight Cars Are Ordered; Total Far Below Normal

Awards for domestic freight cars in May totaled 60 cars, a faint recovery from the zero mark made in April, and a slight gain over May last year when awards amounted to only 20 cars. Bookings in May, 1930 totaled 1,392 cars and for the same month in 1929 awards numbered 7562 cars. During the five months of this year awards have aggregated only 359 cars compared with 4,134 for the same period last year, 31,606 for the 5-month period in 1930 and 56,930 in the same period of 1929. Until the volume of freight traffic increases considerably the carriers will continue its policy of repairing.



	1932	1931
May	60	20
April	0	2,798
March	105	2,166
Feb.	35	50
Jan.	159	100
	1931	**1930**
Dec.	11	2,729
Nov.	35	2,621

	1932	1931
May	25,282	64,355
April	28,524	66,986
March	31,194	65,448
Feb.	33,122	61,114
Jan.	31,336	55,337
	1931	**1930**
Dec.	31,694	53,732

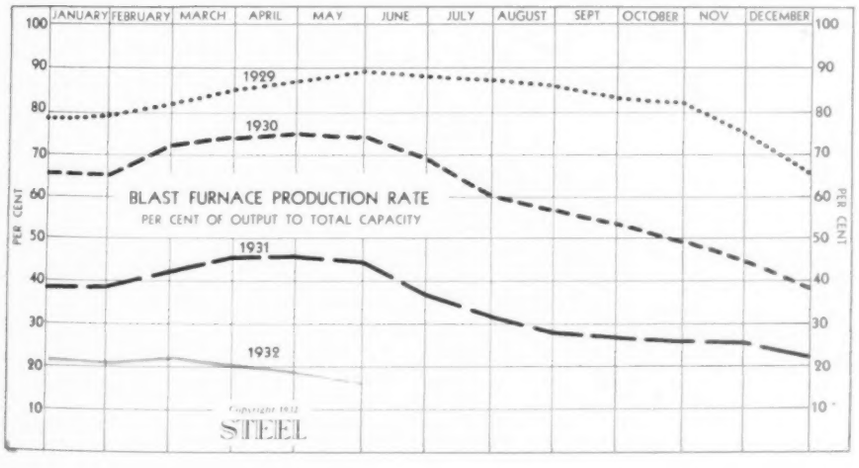


Pig Iron Production Declines To July, 1921, Mark

With an average daily rate of 25,282 tons in May, pig iron production was 3,242 tons or 11.4 per cent less than the 28,524-ton rate of April. The previous low point was 27,892 tons in July, 1921. Production in May, 1931 amounted to 64,355 tons per day and this was the beginning of the present gradual decline which has been continuous save for a slight gain in February of this year. During the five months ending May, total pig iron output was 4,538,505 gross tons, this comparing with 9,460,124 tons for the same period last year and 15,370,106 tons for the first five months for 1930.

Blast Furnace Operations Down As Five Stacks Are Banked

The decline of 11.4 per cent in the daily rate of pig iron production during May was accompanied by a loss of over two points in rate of operation, from 19.8 per cent of capacity to 17.5 per cent. This compares with 44.7 per cent in May last year and 74.2 per cent for the same period in 1930. During the month, four furnaces were blown in and nine were blown out or banked. Of the merchant class, two were blown in while three were banked, with a decrease of one stack. Of the nonmerchant class, two furnaces resumed operations and six were removed from blast, a decrease of 4 units.

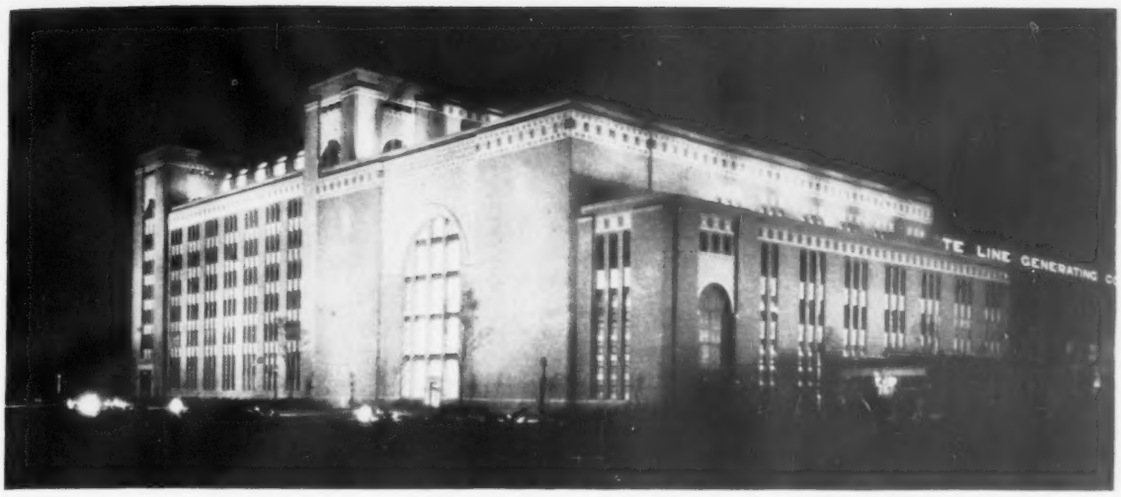


	1932	1931
May	17.5	44.7
April	19.8	46.5
March	21.7	45.4
Feb.	23.0	42.5
Jan.	21.8	38.4

Etching by Charles Perry Weimer, Newark, N. J.

Making Electric Furnace Steel

THROUGH the tremendous heat of the electric arc, man's needs for high-grade alloy steels are supplied. Inherent characteristics of the electric process are high temperature, purity of metal, and lack of oxidation with the complete exclusion of air or gases.



Power plant of Chicago District Electric Generating Corp., formerly State Line Generating Co., on Illinois-Indiana state line in the Calumet district. It has a capacity of 200,000 kilowatts. Pulverized coal is the principal fuel, but gas is burned from time to time when an excess supply requires its use to balance the gas load

CHICAGO STEEL PLANTS EXCHANGE ENERGY WITH UTILITIES

BY DR. A. H. DYCKERHOFF

RAPID development of electric utilities has created the term "super-power," embracing the direct coupling up of large power stations and systems of one or several central station companies covering large areas and the interchange of electric power for the purpose of economy. In comparing the phenomenal growth of electric utilities with the growth of gas utilities we find that the gas industry was somewhat in the vanguard only a few years ago, but now it has entered a new era of further development by the reduced cost of high-pressure pipe lines, being enabled thereby to bring vast volumes of natural gas to centers of dense population where are located large gas consuming industries. Thus, several long-distance gas lines of 500 to 1000 miles length have been completed or are under construction. In the past great economies have been achieved by exchange of energy within the respective groups of gas and electric utilities. In many cases, still greater economies can be achieved by coupling up energy structures of plants of different groups of industries, which have more than one form of energy at their disposal, and by practicing the exchange of energy in various forms between these groups of different genre, a procedure leading to "super-energy."

This principle, for instance, can be applied to the public utilities and the plants of the iron and steel industry, as has been done in the Greater Chicago district in the last few years. In addition to coal, the utilities deal with four forms of energy, while basic steel plants have eight forms at their disposal. It is readily recognized, however, that mainly coke oven gas, electricity and natural gas can serve as a direct means for an exchange of energy, though all other forms of energy, being interchangeable, participate indirectly within the steel plant structures. Large consumption of electric

INTERCONNECTION of electric and gas utilities with steel plants to constitute a three-part regional energy co-ordination is discussed in the accompanying article. The principle actually has been applied in the Greater Chicago district for several years and the experience gained provides the basis for this article. The subject necessarily is outlined here only in a general way, but it is elaborated upon in considerable detail in the Feb. 27, March 5, March 12 and March 19 issues of the ELECTRICAL WORLD. The author, Dr. A. H. Dyckerhoff, 72 West Adams street, Chicago, is engaged in special engineering.

power and gas, and thereby a rapid building-up of public utility plants, is predicated upon a liberal policy in passing any saving in economies to the consumer in low rates. Thus, the consumption of electric power has increased in Chicago from 500 to about 1150 kilowatt-hours per capita from 1918 to 1929, during which period the average energy required by 1 kilowatt-hour generated by the utilities has been reduced from about 27,500 B.t.u. to about 16,200 B.t.u. In the same space of time, consumption of gas has been increased from about 10,000 to about 13,800 cubic feet. As a result of such requirements, the Greater Chicago region demands a total generating capacity of about 1,600,000 kilowatts, the 1930 figure, and has a normal delivery of gas in excess of about 54,000 million cubic feet per year.

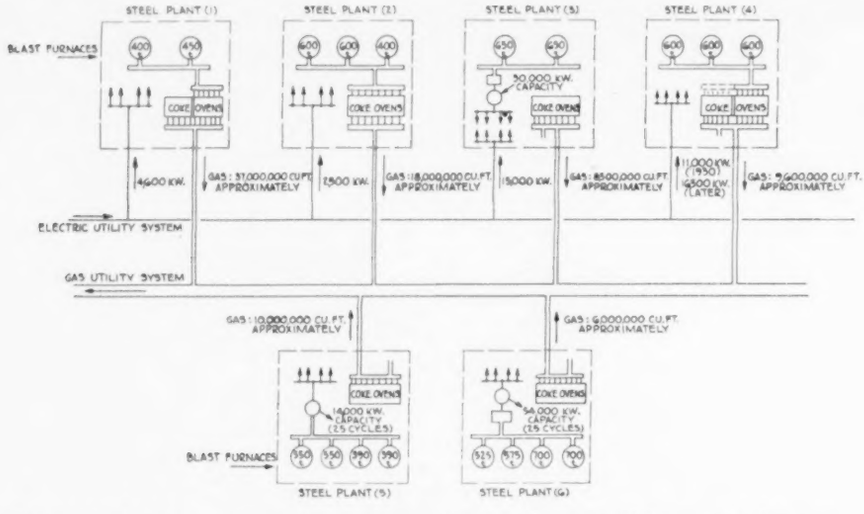


Diagram showing how regional energy in the Greater Chicago district is coordinated. The six steel plants purchase 38,600 kilowatts of electric power and sell about 90,000,000 cubic feet of gas

Producing Economical Power

There are two reasons why the electric utility, as compared with plants of the iron and steel industry, has the lead in producing cheap electric power: First, because of the rapid growth and thereby the immediate application of latest improvements; and second, because of the great diversity of large power consumers, including various steel plant systems. In further illustration of the preceding figures bearing on this condition favoring the utilities, it may be stated that the natural increase in Greater Chicago requires, in normal times, an additional generating capacity of about 150,000 kilowatts, which can be delivered by one unit, generating 1 kilowatt-hour at approximately 12,500 B.t.u. or less, at a steam condition of about 1200 pounds pressure and about 800 degrees Fahr., and when operating at a capacity factor of 75 per cent.

The second reason lies in a favorable diversity factor. Data gathered by the writer show that this factor varied between 0.516 and 0.708 and averaged 0.623. A conservative figure therefore would be 0.715, indicating that the actual investment necessary for power delivered by the utility to steel plants is about 30 per cent less than that for steel mill power plants. As a result, the large power rates in Chicago are low, as indicated by about 0.714 cents per kilowatt-hour for a load of 10,000 kilowatts and a load factor of 65 per cent.

Gas Costs Vary Widely

Before the advent of natural gas in the Chicago district, the maximum load was about 188 million cubic feet per day and the average demand about 146 million, indicating thereby an annual load factor of about 75 per cent. If one were called upon to devise ideal means for supplying energy in manufactured gas, either in one or a few very large plants, he would find under such load conditions that the surplus coke oven gas would cost about 35.6 cents per 1,000,000 B.t.u., the coke oven gas liberated by producer gas underfiring about 51 cents per 1,000,000 B.t.u. and the carbureted water gas necessary to furnish the balance about 85 cents for 1,000,000 B.t.u. These calculated costs bring out the importance of load factor and the rate of delivery if the gas is supplied from any other source.

Due to the marked difference in structure of the various steel plants and the greatly diversified finished products, requirements for energy vary greatly. Decisive for the entire balance are mainly the electric power requirements of rolling mills and energy requirements of heating furnaces on the assumption that two plants to be compared have the same method and tonnage of raw steel production. A survey shows that the kilowatt-hours required per ton of raw steel may vary from 120 to 190 for plants of 50,000 tons per month, and from 95 to 150 for plants of 100,000 tons per month. Energy requirements for heating furnaces may vary at corresponding steel productions from about 275 to 430, and from about 360 to 560 million B.t.u. per hour.

If we select a typical steel plant of medium output and low energy requirements, for instance, one with a pig iron production of about 1800 tons per day, with open hearth and bessemer plants giving a total production of 88,000 tons per month and with coke plant and rolling mills, and if we apply most modern methods to the conservation and utilization of its energy, we find readily that a state of over-economizing can be created. In such a state, the plant operates at times with a great excess of energy, preventing thereby a full return on the investment; it is assumed that the tar from the coke ovens is sold, as is very frequently the case. At other rates of operation there is a decided deficit of energy, and a balance of supply and demand for energy within the steel plant energy structure seldom is accomplished.

Energy Balance Is Lacking

Likewise, steel plants with large requirements for energy naturally show under a similar idealized condition a lack of balance between supply and demand of energy, but mostly a deficit of energy, considering the entire range of operations from low to high output.

The valuation of the energy in by-product gases and waste heat presents a problem at times, being a function of the balance of energy within the steel plant. As long as the demand for energy is equal to or exceeds the supply of energy within the plant, coke oven and blast furnace gas, as well as waste heat, have a definite value. If there is a surplus of energy, however, that surplus represents only such a value as may be obtained through its sale.

Under Chicago conditions, and taking again the typical steel plant as an example, cleaned blast furnace gas ready for use commands a value of from about 19.3 to 20.5 cents and coke oven gas for open-hearth furnaces from 32.1 to 40.0 cents per 1,000,000 B.t.u., the values depending upon the rate of operation of the plant. However, since the available volume of coke oven gas exceeds the requirements of efficient open-hearth furnaces, that value holds only for a limited volume. For burning in heating furnaces, the gas drops to a value of from 29.8 to 37.0 cents.

One of the most important com-

ponents in the steel plant structure is the coke oven gas which is liberated by the underfiring of the ovens with blast furnace gas. The cost of this gas is from 25.15 to 28.0 cents per 1,000,000 B.t.u. when electric power is generated in the steel mill's plant and from 24.7 to 27.1 cents when the steel plant purchases electric power. The value of this gas thus liberated depends upon the requirements for energy within the steel plant, and at best it commands the value of coke oven gas for heating furnaces.

Cost of Energy Misleading

Occasionally, misleading figures on the cost of producing electric energy in steel mill power plants have been quoted. Either they do not contain fixed charges or they apply to a certain condition of plant operation. Taking again as an example a typical steel mill power plant provided with modern equipment and operating generating units and turboblowers at 400 pounds pressure, an investment of from $105.00 to $110.00 per kilowatt installed is required; the total costs vary between about 1.279 cents per kilowatt-hour at 33,100 tons and 0.887 cents at 88,000 tons raw steel production.

The flow of energy from the gas to the electric utility is confined to special occasions, chiefly on weekends when purchased mill gas exceeds the holder capacity, or during brief periods when supply and demand of natural gas are to be balanced. The coupling up of steel mill energy structures and the exchange of energy between these structures provide only a moderate advantage because of the unfavorable diversity factor of the electric loads and the approximate equality of valuation of energy. The occasional delivery of gas by a steel plant to a utility power plant is confined to rare cases such as when the plants are adjacent and when the price of the steel mill gas is about equal or less than coal value.

New South Chicago gas pumping station of the People's Gas Light & Coke Co. in which coke oven gas purchased from steel plants is combined with natural gas to a mixture of 800 B.t.u. per cubic foot for distribution in Chicago. The station has four compressors, two gas-engine driven and two electrically-driven

Mills Should Purchase Current

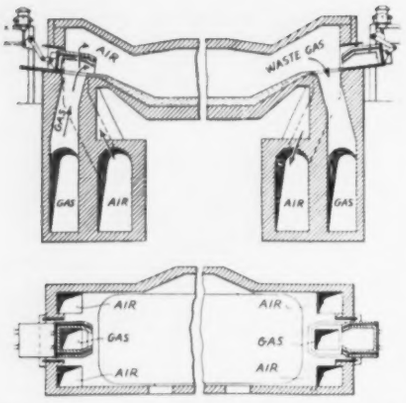
The connecting up of the electric utility and the steel plant for the sole purpose of occasionally exchanging electric energy is uneconomical if the line has to traverse some distance and if the necessary allowance for various expenses and for losses is made. However, since the costs of generating electric energy in steel plants, if properly determined, generally are higher than the price of electric energy purchased in Chicago, it is indicated that the electric energy should flow primarily from utility to steel plants, provided that the blast furnace gas is not being wasted. When fair volumes of electric energy are purchased by the steel plant, it is feasible that the electric utility can occasionally absorb electric energy generated from surplus gas.

The interconnection between gas utility and steel plant system consists in direct connection of the steel plant coke oven gas main with the mains of the gas utility; indirectly, however, the blast furnace gas can share in the interconnection by being utilized to underfire the coke ovens and thereby to liberate coke oven gas. This latter gas thus liberated costs as stated previously between 24.7 and 27.1 cents per 1,000,000 Bt.u. when the steel plant operates its gas washers with purchased electric power. When adding profit to the steel plant, equivalent to a return of the investment in four years, the sales price would be between about 30.5 and 35.5 cents per 1,000,000 B.t.u. In comparing these figures with the calculated cost of manufactured gas as given above, it is recognized that here the energy should flow from the steel plant to the gas utility.

Two batteries of Koppers coke ovens in South Chicago plant of the Youngstown Sheet & Tube Co. The batteries are underfired with cleaned blast furnace gas and the coke oven gas is sold to the People's Gas Light & Coke Co. A part of the electric power required in operation of the plant is purchased from the Commonwealth Edison Co.

Steel Plants Sell Gas

The foregoing considerations show that on a price and cost basis a steel mill on one side should cover the



Regenerative-type open-hearth furnace which has Rose ports to provide efficient use of a blast furnace and coke oven gas mixture. Higher priced coke oven gas thereby is released for sale

greatest possible amount of electric energy from the electric utility, and that on the other side, its coke oven gas, particularly that made available by the import of such electric energy into the steel plant, can under certain conditions compete in cost with manufactured gas. Therefore, the energy structures of these three systems supplement each other valuably. With the purchase of electric energy from the electric utility system, blast furnace gas is liberated for underfiring the coke ovens, thereby making the lowest priced gas indirectly available for sale to the gas utility system. By this means the leanest gas is raised to its highest plane of economic value.

Utilizing Blast Furnace Gas

For these economic reasons the application of the blast furnace gas should follow in this order: Stoves; steam for blowers and for plant uses; heating furnaces; open-hearth furnaces; underfiring of coke ovens; and lastly, generation of electric power only when no other application is feasible. If such a close co-operation is carried through, involving also seasonal control of flow of gas and effecting practically a blending of these three energy structures, the saving to the steel plant would be from 0.43 to $1.36 per ton of raw steel, depending upon the rate of operation.

The principles of exchange of energy discussed in this article have found practical application in several instances in the Chicago district, culminating in a "super-energy" structure such as shown in the diagram on Page 24. The author has been closely identified with this work. It embraces six basic steel plants, having a total capacity of about 9900 tons of pig iron. Further results of the various projects involved have been the most successful use of a preheated mixture of blast furnace and coke oven gas in open-hearth furnaces and the first three installations of equipment for the underfiring of coke ovens by means of blast furnace gas.

With the arrival of natural g in Chicago, the application of the rinciples discussed, which hold in ery respect on their merits, evolve emselves into the problem of tota volume of gas salable to the public and of the adaptation of gas flow from and to the steel plants. Here it should be borne in mind, first, that an 800 B.t.u. mixture of natural and coke oven gas is being supplied to the public with expected increase in sales; second, that some basic steel plants frequently have a deficit of energy within their own structure; and third, that some steel plants have no coke oven or blast furnace gas available as a by-product.

The co-operation between steel plants and gas and electric utilities is a commandment of the present time which is leading to great economies under most conditions.

Develops Sealing Solution For Porous Castings

The Bakelite Corp., 247 Park avenue, New York, announces a new process and sealing solution for reclaiming sweating or leaking castings. It is said that use of the solution insures production of parts fully the equivalent of castings which pass the most exacting inspection and test. The process is not recommended for preparing or reclaiming second quality goods.

According to the manufacturer's claim, the sealing solution is a material of unusual characteristics. It is impossible to melt or dissolve it after proper treatment; it is unaffected by hot or cold water, by steam, or by temperatures up to 400 degrees Fahr.; it is resistant to most chemical reagents, although for fittings to handle chemicals, use should be determined only after consultation with the maker.

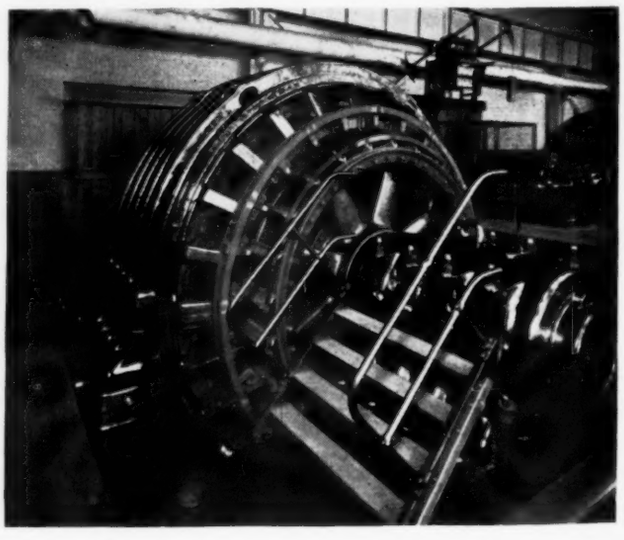
The process requires forcing the liquid solution into the pores of the casting at pressures not exceeding 250 pounds per square inch and subsequent baking in an oven from 1 to 2 hours at 275 to 300 degrees Fahr. Principal use of the process is for aluminum, nickel, silver, bronze and brass castings.

Holds Course in Porcelain Enameling in June

The Ferro Enamel Corp. announces its 1932 training course in porcelain enameling to be held in the company's office in the B. F. Keith building, Cleveland, June 20-25. It is believed there is a great need for newer and up-to-date information at this time, however, this year the course will be limited to one week on account of business conditions.

Classes are to be conducted morning and afternoon of each day except Saturday when only a morning program is scheduled. The instruction will be under the direction of J. E. Hansen, the corporation's research engineer, although classroom work will be supplemented with lectures of prominent enamelers in leading porcelain enameling plants. Lessons will be based upon the new book, "Advanced Technique of Porcelain Enameling," issued by the company late in February. Tuition fee for the course is $25.

Briefly, the course will cover: The metal base for enameling; sandblasting and pickling; mill room practice; mill additions; application of enamel; drying and brushing; burning; inspection; graining and decorative finishes; shop troubles; process control and control methods; wage incentives; production methods; cost accounting and budgeting in the enamel shop; and development of enameling furnaces and equipment.

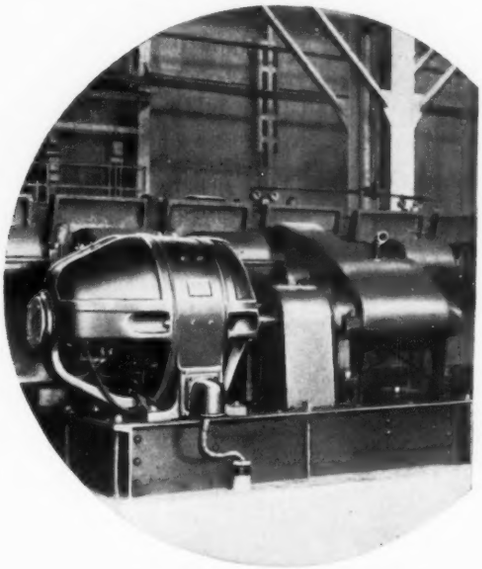


A 7000 - horse power reversing blooming mill motor of Wisconsin Steel Works, International Harvester Co. It is operated on purchased electric power

Heroic Service

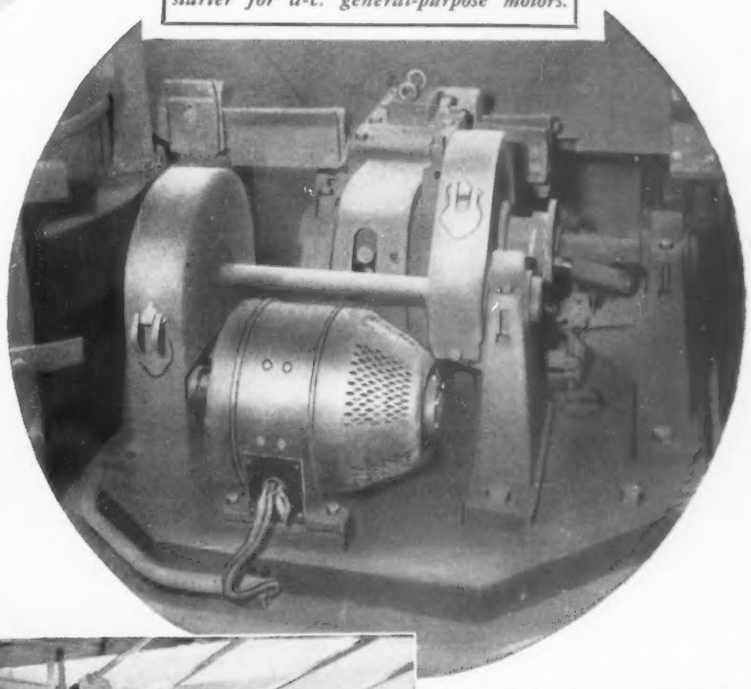
EVERY DAY

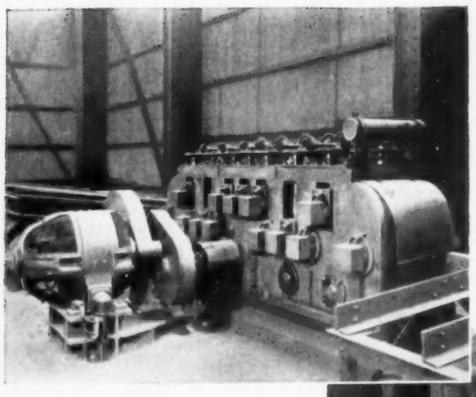
General Electric general-purpose direct-current motors — see them in action in the nation's steel mills. You'll find them doing tough, difficult jobs in hot, dirty, dusty places — and they will stand up because they're built for just such service. These pictures are typical of installations in plants of hundreds of satisfied users. For complete information, consult your nearest G-E office, or the General Electric Company, Schenectady, N. Y.



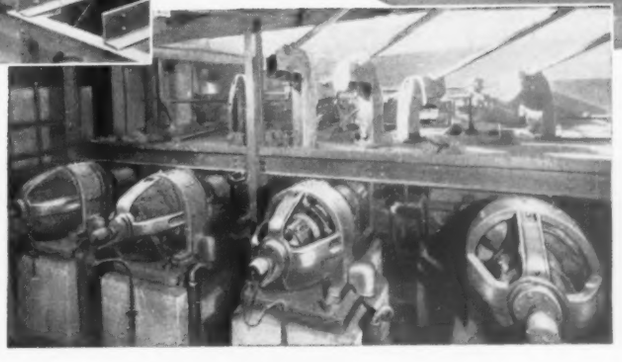
G-E 25-hp. general-purpose d-c. motor operating a tube-mill delivery table

Visit the G-E booth at the AI&SEE convention, William Penn Hotel, Pittsburgh, June 20-23, and inspect the new steel-mill starter for d-c. general-purpose motors.





G-E 25-hp. d-c. motor driving a bar-straightening machine in a large Eastern steel mill



G-E 7½-hp. d-c. motor geared to a combination punch and shear machine on a 10-in. mill

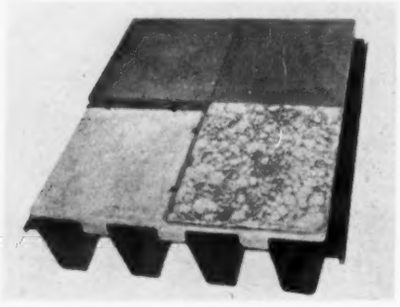
Four G-E 125-hp. adjustable-speed general-purpose motors driving hot rod reels

200-598

GENERAL ELECTRIC

Steel Floor Slabs Made Up Of Preformed Sheets

FABRICATED by preforming two steel sheets and subsequently welding them together in the plane above the neutral axis, a new type of steel floor slab has been developed by the H. H. Robertson Co., Pittsburgh, in co-operation with the Mellon Institute of Industrial Research, Pittsburgh. Marking the culmination of extensive scientific investigation, the new design, known as the Robertson keystone-beam steel floor, is said to provide maximum load-carrying efficiency of the metal and provides permanent electrical flexibility, as well as being incombustible and fire-safe.



Terrazo-type floor finish applied to keystone-beam steel floor members

Shown in accompanying illustrations, these novel floor slabs are 24 inches wide and up to 12 feet 5 inches in length. A cross section taken through the width of a completed unit shows four keystone-shaped cells, all connected together near the neutral axis. As an alternative the upper covering may be a flat sheet instead of the formed type. Sheets may be either 14 or 16-gage thickness.

The four ducts that constitute each unit are spaced at 6-inch intervals and connect directly, when installed, with the corresponding ducts of the adjacent section. This arrangement permits utilization of the floor not only as a load-carrying member, but also as a multiple floor-duct system for handling all types of electrical lines. Installation of electrical outlets within a radius of 3 inches from the exact location required is possible, thereby affording unusual flexibility and precluding electrical obsolescence.

High strength factors, combined with the relatively low weight per square foot (8.26 to 11.75 pounds), make possible substantial savings in building construction because of the decreased load-carrying requirements for floor slabs, columns and foundations.

Installation of the keystone slab can be accomplished easily and quickly, according to the designer, owing to the fact that it may be handled as readily as a large plank. The 24-inch slab is laid across the structural beams and then bolted, clipped or welded to the supporting members, thus eliminating planking and form work with the immediate placement of a floor on which the various trades engaged in building construction may work. The floor is adaptable to various finishes, as accompanying illustrations show. Suspended ceilings and service piping may be attached readily.

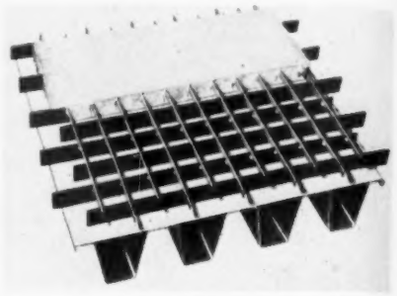
Extra strength of the units makes them suitable for use in bridge floors, it is claimed. Although the present length of the slabs is 12 feet 5 inches, longer spans will be manufactured eventually.

Detailed practical data, including physical properties, are contained in a recently published illustrated research report by Dr. J. H. Young, senior fellow, Mellon Institute of Industrial Research. Copies of the report may be obtained by applying to the institute.

New Magnetic Alloy Is Developed in Japan

Development of a new magnetic alloy, composed of nickel, steel and aluminum, is reported in Japanese trade circles, according to United States Commercial Attache Dowd at Tokyo.

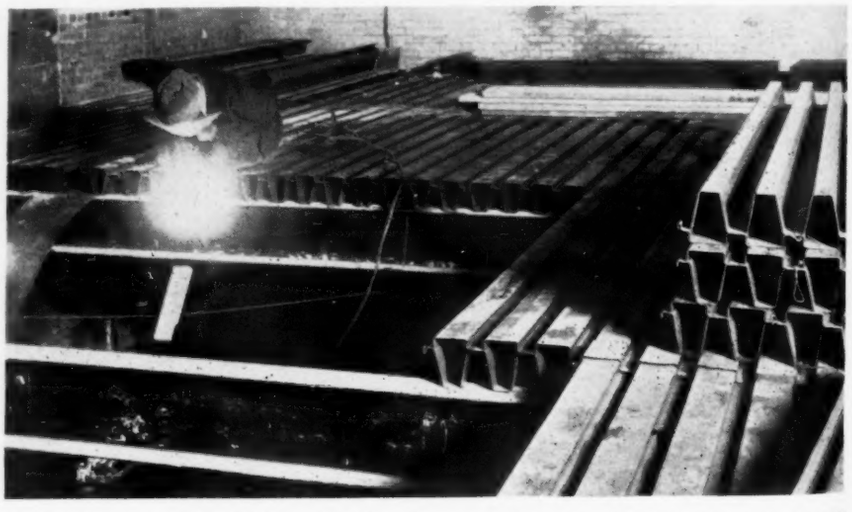
Prior to this invention, what is known as K. S. steel, also developed in Japan, was believed to have had the strongest magnetic characteristics of any metal or alloy. The new alloy is claimed to have twice the magnetic strength of K. S. steel, to cost one-fifth as much, to weigh 20 per cent less and to be more durable, according to the report. It has been patented in Japan, Great Britain, United States, Germany, France, Italy, Canada, Switzerland and Sweden.



Alternate type of floor unit with flat top sheet on which has been placed steel grid with concrete fill to make a strong bridge floor

Is Licensed To Fabricate High Temperature Alloy

Driver-Harris Co., Harrison, N. J., has been licensed by International Nickel Co., New York, to melt and fabricate Ni-Resist, a corrosion-resisting alloy containing 14 per cent nickel, 6 per cent copper, 2 per cent chromium and the balance cast iron. The alloy resembles cast iron both in its method of production and application, but is resistant to growth, scaling and warpage. It finds use in the chemical, electrical, oil refining and automotive fields.



Steel floor units, in 12-foot lengths, here are being welded to the structural cross members

The Complete Line of Pittsburgh Piping Welding Products

●

Pittsburgh Piping & Equipment Company now offers a complete line of Durex Welding Products to augment the Creflex Bends recently announced.

These products cover the entire field of pressures up to and including 600 lb. per sq. in. and temperatures up to 750° F., with thicknesses conforming to the A.S.A. recommendations for the service.

The first three products shown are Creflex Bends which are made of seamless steel pipe. These bends can be made on radii as small as one and one-half times the nominal pipe diameter and to any desired angle.

Durex Welding Stubs, Necks and Butt-welding Flanges are manufactured regularly with the conventional raised face. Male and female, tongue and groove, or Sarlun facing can also be supplied.

Durex Welding Clamps are a very valuable accessory to preserve the alignment to two adjoining pipes when welding.

Durex Welding Heads, Reducers and Clamps are other Pittsburgh Piping products manufactured to facilitate and expedite welding installations.

Booklet W-101, which gives the descriptions, dimensions, and prices of Creflex Bends and Durex welding products will be mailed on request.

PITTSBURGH PIPING AND EQUIPMENT COMPANY

43rd Street and A.V.R.R. Pittsburgh, Pennsylvania

BRANCH OFFICES:

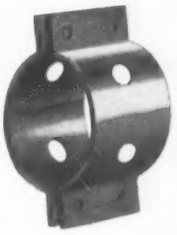
New York Chicago Boston Detroit
Cleveland San Francisco Indianapolis Houghton

90° CREFLEX BEND
In sizes 2" to 24"

180° CREFLEX BEND
In sizes 2" to 24"

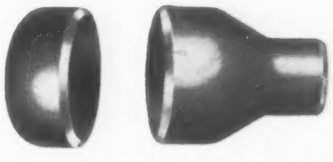
45° CREFLEX BEND
In sizes 2" to 24"

DUREX WELDING STUB END
In sizes 1" to 24"



DUREX WELDING CLAMP
In sizes 3" to 24"

DUREX WELDING REINFORCEMENT SLEEVE
In sizes 4" to 24"



DUREX WELDING HEAD
In sizes 3" to 24"

DUREX WELDING REDUCER
In sizes 3" to 24"

DUREX BUTT-WELDING FLANGE
In sizes 1" to 24"

Officers in Navy and Army Win Arc Welding Prizes

FIRST and second awards in the second Lincoln Arc Welding Prize Competition sponsored by Lincoln Electric Co., Cleveland, were won by officers of the United States navy and army. First prize of $7500 went jointly to Lieut. Commander Homer N. Wallin and Lieut. Henry A. Schade of the navy and second prize of $3500 to Major G. M. Barnes of the army.

Approximately 400 papers were submitted in the competition and were reviewed by the jury under the direction of Prof. E. E. Dreese, Ohio State university, Columbus, O. A resume of the savings to be effected by using arc welding extensively in all industries was estimated to be almost a billion dollars a year, provided the process is used as extensively as possible.

Both Lieut. Commander Wallin and Lieut. Schade were members of the construction corps at the navy yard, Mare Island, Calif., although the latter since has been transferred to Washington. The title of their paper was "The Design and Construction of an Arc-Welded Naval Auxiliary Vessel."

Major Barnes is chief of design and engineering, ordnance department, Watertown arsenal, Watertown, Mass., and the title of his paper was "Manufacture of Ordnance at Watertown Arsenal Revolutionized Through Arc Welding."

"The Application of Arc Welding to the Design of Steel Buildings for the Resistance of Earthquake Forces," won third prize of $1500 for H. H. Tracy, structural engineer, Southern California Edison Co. Ltd., Los Angeles.

A $750 fourth award went to Gustav F. D. Wahl and Harry E. Johns, Kiel, Germany, for a paper on a special river-sea bulk cargo ship. H. J. L. Bruff, Harrowgate, England, won fifth prize of $500 for "Strengthening Weak Iron and Steel Bridges by Arc Welding." A paper on arc welding steel cars won $250 for William H. Zorn, Wyandotte, Mich. Thirty-five additional prizes of $100 were awarded to writers of papers which showed the application of and savings possible by arc welding in every industry.

Welding Auxiliary Vessel

The first prize winning paper describes the construction of an arc-welded auxiliary vessel for use with the fleet at San Pedro. The hull is conventional ship-shape in form and 118 feet long, with a full-load displacement of 300 tons. Speed of the craft is 10 knots.

Arc welding had never been used in the construction of gun carriages until the 3-inch antiaircraft mobile mount described in Major Barnes' paper was built. This piece of ordnance was selected because, in addition to being the most modern type of post war carriage standardized by the army, it was subjected to severe road tests as well as the impact forces of firing. The principal parts of the carriage are highly stressed and of intricate design. Welding is now an approved method of manufacture for ordnance structures.

Mr. Tracy's paper on arc welded steel buildings to resist earthquake shocks deals with the construction of a 13-story general office building of the Southern California Edison Co., Los Angeles. By application of arc welding, the structure will resist seismic shocks of an intensity comparable to those of the San Francisco and Tokyo earthquakes.

Checks Won't Bounce

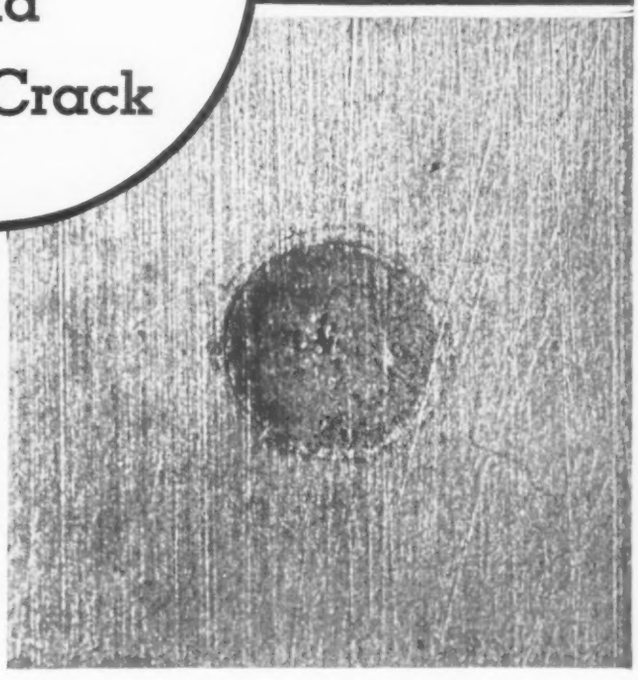
The first three prize winners received what are believed to be the most unusual check ever issued. These checks, for $7500, $3500 and $1500 respectively, were "written" on ⅛-inch sheet steel. Each check was 24 inches long and 10 inches wide. All information, including date, amount, payee and name of bank was arc welded, welding operators in the Lincoln plant relieving the treasurer's office of this detail. The checks were signed by arc welding, the illustration on Page 9 showing J. C. Lincoln affixing his signature. A close-up view of the first-prize check is shown on this page.

The prize winners will endorse the checks by the same novel method and when the panels of steel are presented to banks and paid, they will be returned to the bank of issue, where guards will cancel them with the aid of a submachine gun.

AT THE left are shown Lieut. Commander Wallin and Lieut. Schade, first prize winners in the Lincoln arc welding competition. The completely arc-welded vessel described in their paper appears in the background. Below is the steel check used to pay the winners $7500. Second and third prize winners were paid in the same way. The checks will be canceled by machine gun

1000 BRINELL and not a Crack

Brinell impression showing absence of cracks in chrome-vanadium nitrided steel case



Brinell impression showing cracks developed in less ductile nitrided steel case

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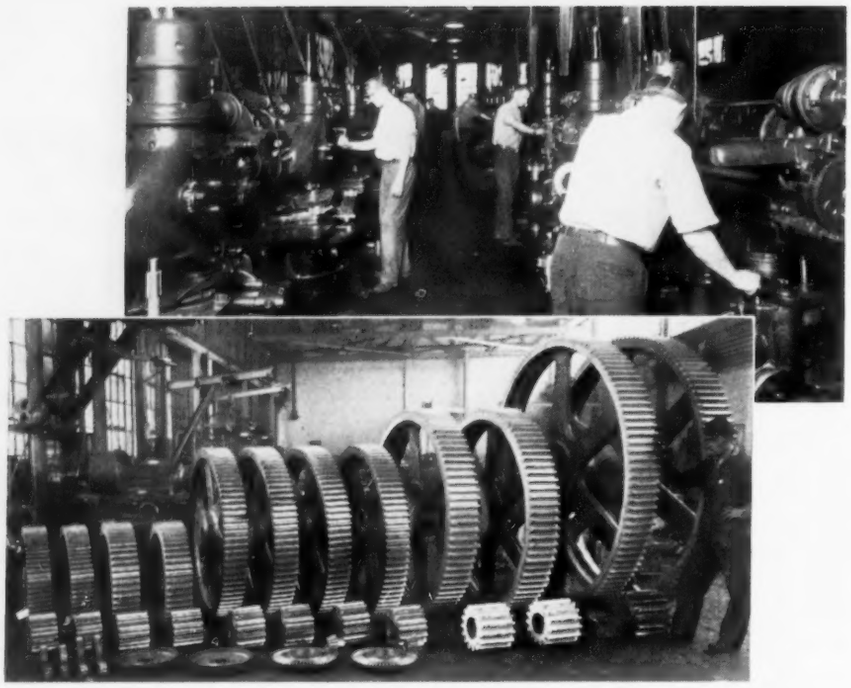


Upper photo, courtesy Gears & Forgings Inc.

Steel gears range in weight from less than an ounce to 138 tons or more. The illustration shows a wide range in sizes. Above, cutting gear teeth in automatic machines

Large Uses of Steel In Small Ways

219th Article ◆ Gears

STEEL used for the manufacture of gears normally amounts to 575,000 net tons a year, according to an estimate by one of the leading producer's chief engineer. This authority states that the weight of steel gears in automobiles and trucks average 200 pounds per car, and as the output of cars has averaged 3,772,845 annually in the past five years this indicates a consumption of 377,284 tons for automotive gears.

The steel industry itself is one of the largest users of gears, the amount for rolling mills alone being estimated at 25,000 tons annually. This estimate is arrived at by the known tonnage of rolled steel products that can be manufactured with a set of rolls and gears. The same authority estimates 25,000 tons annually for tractors, farm and dairy equipment, power shovels and road equipment. These three classifications, experience has shown, account for 75 per cent of all gears, by weight. Rubber and chemical industries rank high in the list of other users.

About 85 per cent of the steel used in gears falls in the plain carbon classifications, though the trend is toward alloy steels, especially those in the nickel, chromium and molybdenum groups. The evolution of gears has been from wood, in primitive times, to cast iron, to plain carbon steel, without heat treatment; then to carbon steel, heat treated, and in the past five years to alloy steels, heat treated. Demand for strength and compactness became insistent with the growth of the automotive industry. It has spread throughout practically all manufacturing lines, until some authorities predict that in ten years more gears will be made from alloy steels than from plain carbon.

Spur Gears Lead Production

Seventy-five per cent of all steel gears are of the spur type; 10 per cent, bevel; 5 per cent, worm; and the remainder, helical, spiral, herringbone, and other types. The majority fall in a range of sizes from 3 to 15 inches diameter, though many are made that are less than one-half inch diameter, weighing less than an ounce. At the other extreme, a maker of steel mill equipment a short time ago announced a gear 21 feet, 4 inches diameter, weighing 138 tons. Attempts have been made recently to incorporate steel in certain gear-mechanisms in watches, in combination with nonferrous metals. Gears of ponderous weight are used to lift bridges.

Steel gears are made by various methods, the most general of which are: By machining sections of round bar stock; by forging a blank, and then cutting the teeth; by casting; and by building up a blank by means of welding parts together, then cutting the teeth. Small gears are made directly from bar stock in automatic machines. The largest number of gears, however, are made by cutting off a section of a steel billet, forging it to shape, then turning and boring it in a lathe, and finally cutting the teeth by any one of five different processes. The maximum economic limit for forged gears is said to be 48 inches diameter. Some of the large cast gears are made in segments, bolted together. The teeth are cast in these gears, then machined.

A Specialized Industry

Gear production is a highly specialized industry, although a number of manufacturers of steel products are making all or some of the gears they use. An interesting installation is noted in the Ford Motor Co.'s Dearborn, Mich., plant, making the pinion on the rear axle shaft for the new Ford models.

It may be said in passing, that a number of manufacturers not in the Ford class who have attempted to make their own gears have in the end found it more economical to purchase them; even some of the best equipped manufacturers do not make all the gears they use in their products.

An important application for gears is in speed reducers, which are coming into larger use. The housings for these reducers generally have been made of cast iron, but pressed steel now is being employed, and the makers claim the complete unit is lighter and more economical.

Probably one of the strangest uses to which gears ever were put came to light recently when a museum of natural history wanted to wash the sand from precious fossil remains. By means of a speed reducer, a trough containing water in which the remains were immersed, was rocked so gently that its movement could scarcely be perceived, yet so steadily, day and night for a time, that the sand was removed without damaging the remains. In another instance, a triple reducer was used for exhibition purposes, with a reduction of 8,000,000 revolutions down to one, the output shaft revolving once in eight hours.

Demonstrates New Principle Of Rolling Hot Strip

APPLICATION of the Steckel-type mill to the hot rolling of strip was demonstrated last week by officials of the Cold Metal Process Co. to a group of about 60 engineers including 14 from France, Belgium, Germany, England, Wales, Sweden, Czecho-Slovakia, Italy and the Saar. The mill, an experimental assembly, is located at the Brier Hill plate mill division of the Youngstown Sheet & Tube Co., Youngstown, O.

Only one stand of 4-high rolls is used, this being served by two elevated holding furnaces, one spanning the approach table and the other the runout table, as shown in the accompanying illustration. Mounted inside each furnace is a 48-inch diameter reel made of chrome-nickel heat-resisting steel. The purpose of the furnaces is merely to restore the initial heat of the slab so that as the partially-rolled piece emerges from the furnace and enters the rolls, the temperature will be uniform throughout its length.

During the demonstration slabs 4 inches thick, 9 feet long and weighing approximately 2500 pounds, were used as the raw material. Each slab, heated to about 1600 degrees Fahr., is brought from the slab heating furnace by crane, deposited on the approach table leading to the mill, and then run through a scale breaker. While in transit through this unit the steel passes between two circular steel brushes which rotate at high speed and loosen the scale on both the top and bottom surfaces and, as the piece progresses, sprays of high-pressure water, directed against both surfaces, remove the loosened scale.

After the slab leaves the scale breaker it enters a set of pinch rolls, equipped with an air-opereated hold-down and driven by a separate motor, which direct it into the 4-high mill equipped with 20-inch diameter work rolls and 36-inch backup rolls, all with 72-inch body. The steel is given 11 passes back and forth through the mill and, following each reduction, is conveyed beneath the holding furnace spanning the roller table, away from the mill.

Previous to the eleventh pass a set of dogs is canted on the roller table on the runout side and, as the front end of the piece emerges from the mill and finally the pinch rolls, it is directed at an upward angle by the dogs into the holding furnace and reeled into a coil while reduction of the remaining section continues. The holding furnace is gas fired and preserves the steel at 1600 degrees Fahr., the initial temperature of the slab.

Pinch Rolls Are Automatic

When the rear end of the piece emerges from the mill and is still in the grip of the pinch rolls at the exit side, the mill is reversed and the strip returns through the work rolls and pinch rolls and into the opposite holding furnace where it again is reeled and restored to a temperature of 1600 degrees. To prevent excessive tension on the piece in the process of reduction, only one set of pinch rolls functions, this always being on the rear side of the mill for the purpose of pulling the stock through the rolls and off the reel at the entrance side.

Reduction continues with the piece being coiled and uncoiled from the eleventh pass to the end of the fifteenth pass. Following the sixteenth and final pass when 4-inch slabs are on schedule, the steel instead of entering the holding furnace is conveyed away from the mill by a roller table to a cold, motor-driven reel and wound into a coil. As delivered to this coiler, the piece measures 400 feet long and 20 inches wide and gages 0.109-inch or about 12 gage.

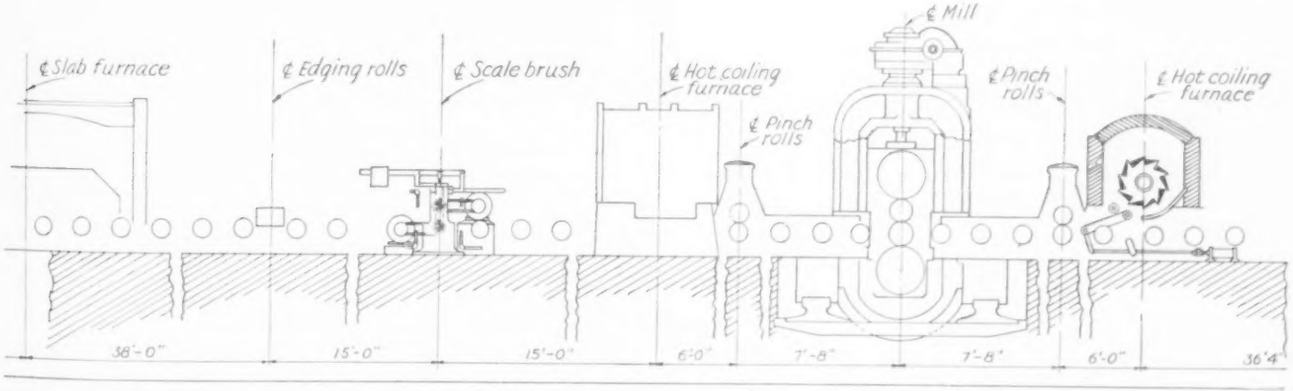
The present mill is only an experimental assembly of apparatus and is not indicative of the full capabilities of this new type construction. The maximum rolling speed possible in the present setup is only 300 feet a minute and will be increased to about three times this speed in the next installation.

Based on the present low speed, a slab 4 inches thick and 9 feet long is converted to strip of about 12 gage (0.109-inch) in 6 to 6½ minutes. A conservative estimate of the effect of three times faster speed would be to reduce this rolling cycle to less than 3½ minutes.

Lighter Construction Suitable

The massive housings and air-cylinder construction over the pinch rolls will not be repeated in any future mill since experimental operation has proven that pinch rolls are necessary merely for manipulating the ends of the piece. This will require only a light weight device instead of the present cumbersome construction, which was provided because of the original intention to exert a heavy pull on the material through the pinch rolls. While motors of 150 horsepower are used on the experimental mill to drive each pair of pinch rolls, only 50-horsepower drives will be employed on future installations.

The product rolled at present has considerably more crown than will be tolerated but the development of this refinement has been postponed purposely to save the expense involved in regrinding and changing rolls. While no edging rolls are used on the experimental setup they will be included in the design of any future mill in order to hold any desired width of product and to break up the initial furnace scale.



Elevation of proposed 48-inch Steckel-type hot mill which employs a single stand of 4-high rolls for converting slabs to strip and holding furnaces for maintaining uniform temperature during reduction

FOREWARNED is FOREARMED

A small change of iron in your castings will guard against defects which cost time and money.

THE buyer of castings knows better than anyone else what trouble-makers defective castings can be. They break down and wear out before their time. They necessitate costly replacements. They detract definitely from the quality of your finished product.

Knowing this from experience, the progressive buyer of castings is forewarned. And he should be forearmed accordingly — especially when it is so easy to insure castings against defects.

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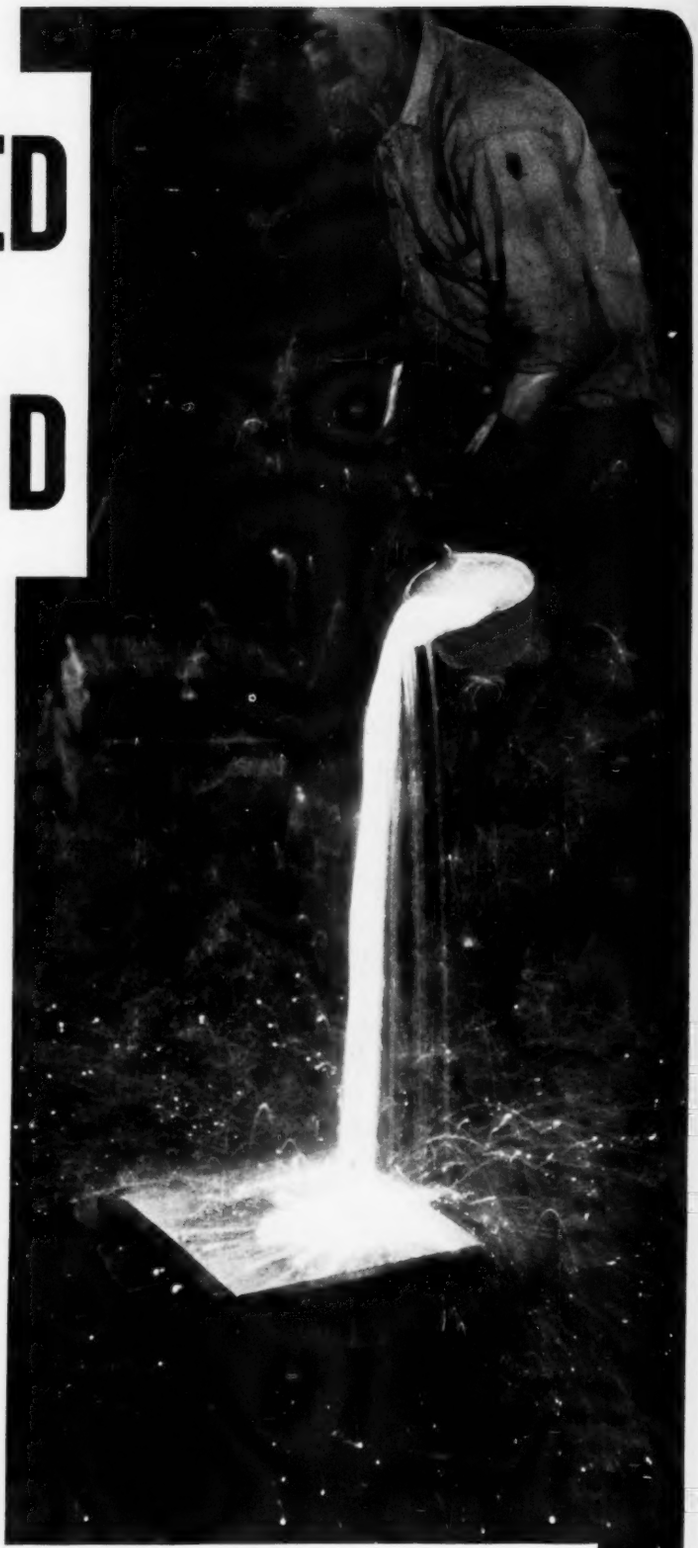

YOUR CASTINGS . . . *made with Charcoal Pig Iron have* . . . GREATER DENSITY · ADDED TOUGHNESS · MORE STRENGTH · LESS SCRAP LOSS · GREATER UNIFORMITY · EASIER MACHINABILITY . . . *and you get higher quality finished products*

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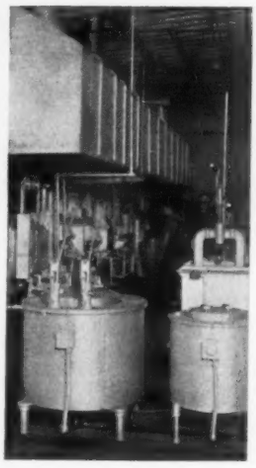
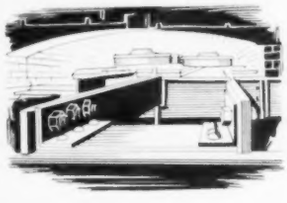
Making the Most of

METHODS AND MATERIALS



BECAUSE its practice in pickling small gray iron fittings is unusually severe, a southern manufacturer of pipe and fittings recently purchased pickling baskets fabricated from monel metal. The castings are dipped first in 5 per cent sulphuric acid solution at 70 degrees Cent. for 5 minutes, then washed in water. Next they are dipped in 4 per cent hydrofluoric solution at 60 degrees Cent. for 45 minutes, then washed in water. Finally, they are dipped in a 12 per cent muriatic acid at 50 degrees Cent. for 3 minutes. In each of these operations the baskets are revolved end over end to permit the fittings to receive the full effects of the acid. From present indications monel metal will meet these extreme service conditions successfully.



A STEEL producer in Pittsburgh district has developed a heat treating process for rolled steel car wheels which produces a tough-tread section without affecting the structure of the hub or flange. A continuous furnace is employed and it is claimed a superior grade of car wheel is being produced.

\$ \$ \$

A small item made of steel of a certain specified chemical composition was being used frequently by a large electric public utility. The steel differed but little from that which was used regularly by the manufacturer. Investigation revealed that this steel was satisfactory for the service intended within the company, therefore, it is now being used instead of the special analysis material. This has made unnecessary a special run for the nonstandard item with a saving which can be summed up as several weeks in delivery time and nearly 50 per cent in cost.

\$ \$ \$

A radiograph of a section of a 460-pound U-shaped manganese steel casting, with a square lug in the center of the section, disclosed large shrinkage and gas cavities at that important section, which would have materially weakened the casting. The inspection was made and the casting rejected prior to about \$100 in necessary machining. It was found in experiments on similar smaller castings that even after machining, the true condition was not shown without X-ray inspections.

\$ \$ \$

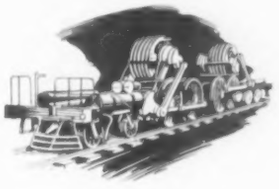
Several manufacturers of cutting tools are giving serious consideration to the merchandising of chromium-plated tools to the trade. Such plating at the present time is being done largely by companies using the tools. By chromium plating, some of these users have found that the life of such tools as files, twist drills, reamers, planer-tools, die-blocks, etc., has been multiplied, in some cases, 15 times.

\$ \$ \$

Soft wheels with a speed not over 7000 peripheral feet per minute, carefully prepared, trued and balanced, with moderate pressure, are essential to avoid burning and consequent distortion and discoloration in polishing for chromium plating. Best results depend largely on the properly selected abrasive, rather than excessive speeds with pressure. The final buffing operation then is easier, resulting in a smooth bright finish. Most chrome-alloy metals have low heat conductivity, therefore, local over-heating may result at the point of contact if too high speeds are used or excessive pressure is applied.

\$ \$ \$

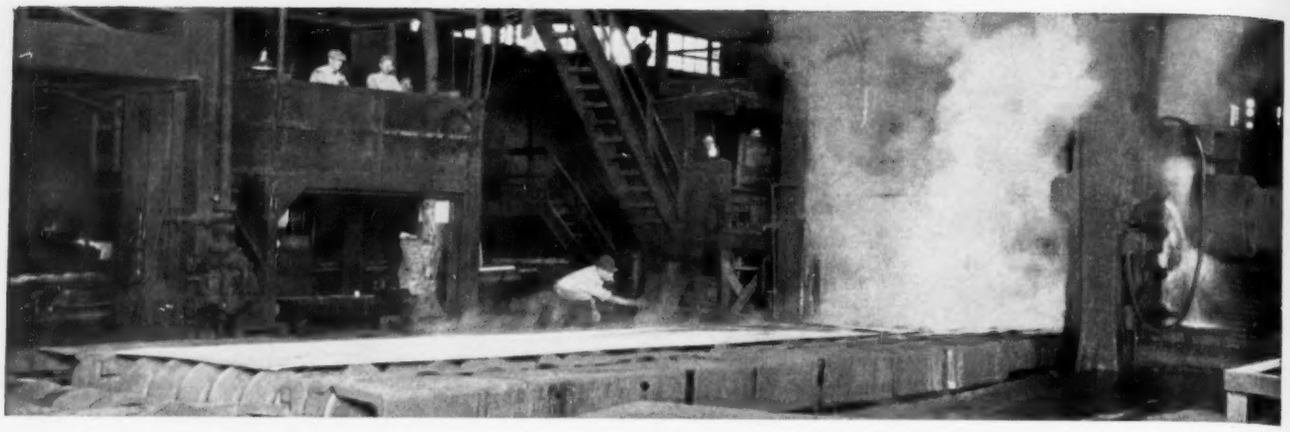
Because it was impossible to hold a forging within required limits, a western manufacturer found it necessary to overhaul a 6000-pound drop forge hammer. Dismantling piston, ram and ram guides revealed that the hammer was 3½ inches out of plumb one way and 2 inches the other way; also, about two-thirds of the back of the ram guide channel on the right column was broken in several places. The column would either have to be replaced or repaired by welding and the latter was chosen. The column was about 10 feet high, tapering from 3 x 2 feet at the bottom to 1½ x 1 feet at the top, and had a wall thickness of about 3 inches. Delivery of a new column would cause a delay of four or five weeks and the cost would be \$2000 with probably \$200 to \$300 more for installation. Repair by arc welding cost about \$200 and the time required was 80 hours.



A GREAT amount of pipe bending is required in building electric locomotives and to facilitate this work one builder installed electric resistance welders and used them alongside each locomotive for heating the pipe and forming the bends as needed. The method is rapid; pipe from 1 to 3 inches diameter can be heated in from 3 to 8 seconds. Resistance welders also can be used for heating structural shapes which must be bent.

\$ \$ \$

Good steel was made in this country 50 years ago. A long-established Eastern manufacturer of saws some months ago offered to trade new saws for saws that had been in service for over 50 years. The old saws started to come in and shortly the company had accumulated 120 of them and it decided to withdraw the offer. A couple of weeks ago, it made an exception, trading a new saw for a rip-saw that had been in service for 74 years and still was in perfect shape, although it had been filed down to about 75 per cent of its original size. These saws were all made of crucible steel.

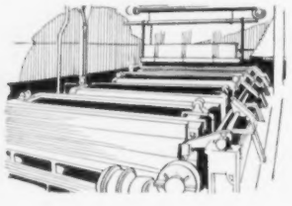


PROGRESS IN STEELMAKING

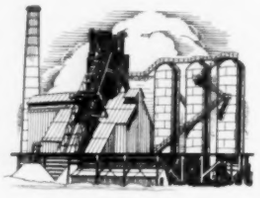
INTRODUCTION of the push-bench mill at a plant in the Pittsburgh district establishes another method for manufacturing seamless tubes in this country. In the production of tubes by this process, a heated billet is pressed hydraulically into a thick-walled thimble. This is placed over a mandrel and is pushed through multiple stationary ring dies which reduce the wall thickness and elongate the blank into a closed-end tube. After the mandrel is withdrawn, the closed end is sawed off and the tube then subjected to the usual finishing operations. The method affords the production of small diameter seamless tubes at a low cost figure.

♦ ♦ ♦

Increases in welding speeds of 50 to 60 per cent and reductions in the cost of welding ranging from 25 to 30 per cent have been effected by the multiflame blowpipe. The new unit directs several flames along the line of the seam. One flame preheats the work, another melts its edges and a third flame serves to preheat the welding rod. The multiflame blowpipe also has been found useful in steel mill practice for cutting plates of various thicknesses.



UNIFORM pickling of sheets and strip with less danger of pitting, burning and wasting of metal is being obtained by many producers through the use of larger tanks which permit of low temperature, low acid strength and longer pickling time. Best results are obtained with large volume tanks when a 4 to 6 per cent acid solution at 150 degrees Fahr. is used and with an immersion time of 30 minutes. When pickling with a 6 per cent solution the iron content should be allowed to increase until it reaches about 5 per cent.



MANY European blast furnaces now use silica brick for the under hearth; carbon brick for the hearth and bosh to withstand the temperature variations and scouring action of the slag; and aluminous brick of high-resistant quality for the in-walls.

♦ ♦ ♦

Secondary open-hearth regenerators built in the flues to provide additional capacity to overcome the limitations of primary chambers, afford an increase in the combined air preheat of primary and secondary chambers of 11.7 per cent, according to a recent investigation.

♦ ♦ ♦

Intercrystalline brittleness of 18-8 rustless steel is prevented, according to tests conducted in Germany, by adding either 0.7 per cent titanium or 7.0 per cent tungsten.

♦ ♦ ♦

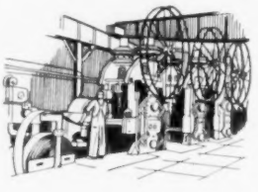
Diminution of the iron content of the flux layer in galvanizing practice is not caused by volatilization of iron chloride, according to German investigation, but is due to the reaction forming zinc chloride and metallic iron. Hence, all pickled steel should be washed free of iron salts before it is fed into the zinc pot and the use of an inhibitor is recommended to maintain reasonably low iron salt concentration in the pickling bath.

♦ ♦ ♦

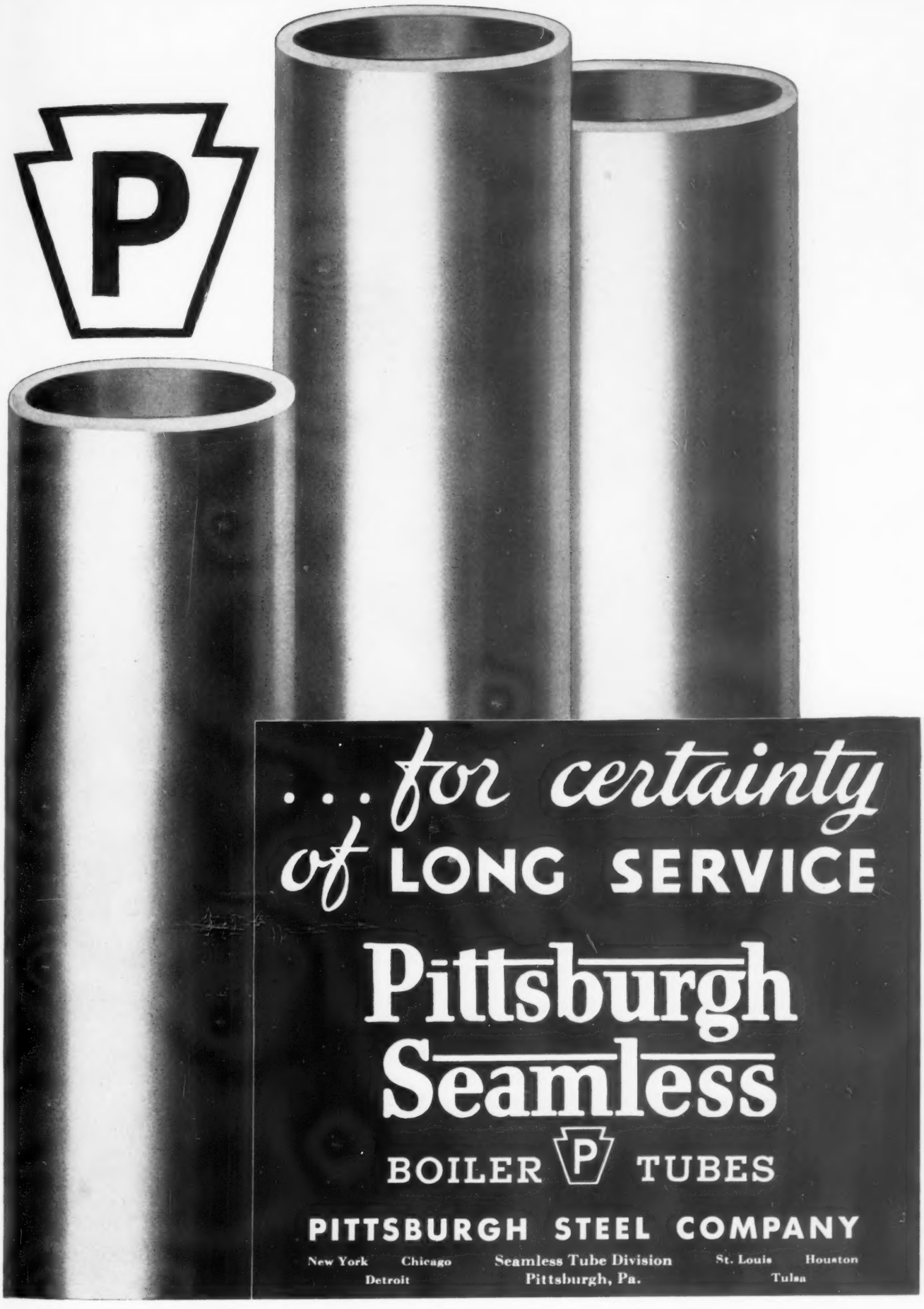
Recent tests disclose that good forgeability and cutting efficiency of 18 per cent tungsten, 4 per cent chromium, 1 per cent vanadium and 0.70 per cent carbon high-speed steel are afforded when the carbon is increased about 0.2 per cent for each 1 per cent increase in the vanadium content.

♦ ♦ ♦

Improvements in the Dwight-Lloyd sintering machine have been introduced by supporting the weight of the loaded pallets on rollers attached to the pallet pins and taking the weight off the top of the windbox and transferring it to a parallel track. This modification is claimed to afford a reduction in the power required to drive the machine and in the wear produced by the sliding contact between the windbox and pallet, to give larger outputs, to permit deeper sinter beds and to decrease the power required to drive the suction fans. The new device can be applied to any existing plant at small expense.



CONTROL equipment for a 4-high cold strip mill at a Cleveland plant is so arranged that the motor driving the reel automatically maintains the strip under tension, regardless of whether the mill is idle or operating.


P
...for certainty
of LONG SERVICE
Pittsburgh
Seamless
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New York Chicago Seamless Tube Division St. Louis Houston
Detroit Pittsburgh, Pa. Tulsa

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Bench Center Is Accurate Inspecting Tool

—Barber-Colman Co., Rockford, Ill., has designed a bench center which may be used for gage-testing circular, cylindrical, and such other work as may be held on arbors, and such pieces as shafts, pinion shafts, plugs, and others that may be held between centers. This inspecting tool, shown in the accompanying illustration, also may be employed for determining the parallelism of keyways with regard to the axis of the shaft, or eccentricity.

Ribbed box construction features the bed which has scraped dovetail ways. Head and tailstock are independently adjustable, each being fitted with a hardened and ground steel center. The tailstock has a spring-loaded center which may be clamped while a piece is held between centers.

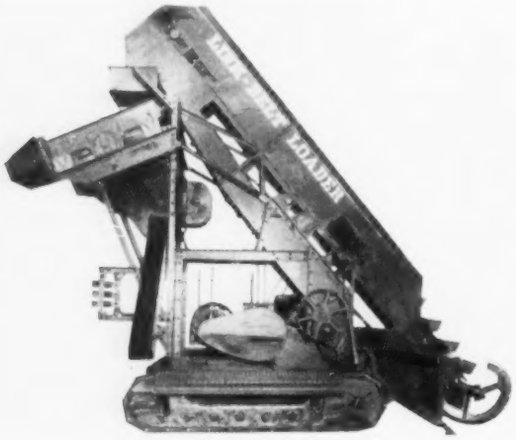
◆

Principle of Unit Similar To Swaging

Langelier Mfg. Co., Providence, R. I., just has designed and built a battery of machines, one of which is illustrated herewith, to be used for forming automobile rear axle housings after welding the two pressed steel halves. The unit is employed to hammer the section at the end of the housing to which is attached the spring perch.

The principle on which the machine is constructed is similar to swaging, and the main spindle, driven by the flywheel, carries six rolls which strike a roll in the oscillating plunger that is made to receive the upper die. Motor driven through V-belts, the spindle rotates at 300 revolutions per minute, striking 1800 blows a minute on the work.

A variable delivery high-pressure pump operates the lower die through a toggle joint from a hydraulic cylinder. The rotating mechanism is equipped with an air-operated collet type chuck and air tailstock, the drive being made from a speed reducer belted to the flywheel.



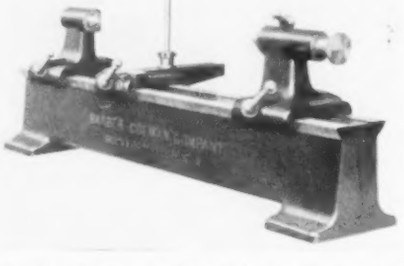
LOADER with vibrating screen developed by Link-Belt Co., incorporating features which provide greater clearance under chute to truck. Inclination of the screening surface can be varied easily on the job

◆

Manufactures Loader with Vibrating Screen

Link-Belt Co. is manufacturing at its plant at 2045 Hunting Park avenue, Philadelphia, a vibrating screen loader, shown in the illustration above, left. Cantilever leaf springs maintain the screen box at a constant angle, being adapted for the circular motion produced by the action of eccentric, positive drive.

The entire loader is under the complete control of the operator, all levers being within easy reach. Bucket elevator capacity is 1¾ cubic yards a minute, with uniform speed, the foot of the loader being equipped with an improved steel ribbon feeder which clears a path 7 feet, 7 inches wide.



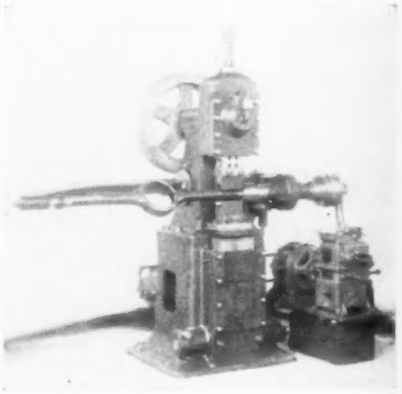
Barber-Colman adds this bench center to its equipment line

◆

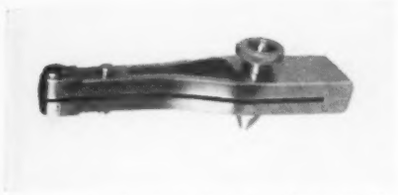
Brinell Hardness Tester Is Portable

R. Y. Ferner Co., Investment building, Washington, has developed a dwarf brinell press, a portable hardness testing instrument adaptable for use in any part of a plant where a drill or arbor press, a vice or a large C clamp is available for applying the necessary pressure. The instrument consists, as shown in the illustration on page 39, of a heavy piece of steel about 7¼ inches long, ⅞-inch thick and 1⅝ inches wide at one end, tapering to a width of ¾-inch, slit to form a two-pronged spring. On the under side, near the end of the slit, is mounted a holder for the steel ball which is 5 millimeters diameter. Opposite this, on the upper prong is a knurled knob to which pressure is applied.

Pressure is released after a 30-second period and the impression is ready to be measured. For this there is provided an evolute loop, a magnifying glass which is equipped with



Langelier production unit employs principle similar to swaging



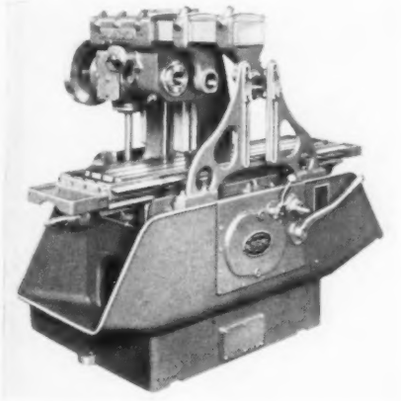
Dwarf brinell press developed by R. Y. Ferner Co. is portable

a cam having a rim with an evolute curve. The magnifying glass is mounted on a hinged arm connected to a base with a beveled edge which serves as a reference mark or index to be placed in contact with one edge of the brinell impression.

◆

Embodies New Features In Lathe and Miller

Sundstrand Machine Tool Co., Rockford, Ill., has announced a new stub lathe and rigidmil, the latter being shown in the accompanying illustration. Some of the features of the rigidmil include a one-piece frame casting, large coolant reservoir and chip screen, welded steel extension bolted to base to keep chips and coolant off the floor, and centralized controls for clutch, feed and head elevation.



Rigidmil manufactured by Sundstrand Machine Tool Co.

The 8-inch lathe has a compact heavy base containing the motor compartment, coolant reservoir and chip pan.

◆

New Recorders Cover Wide Range of Service

Esterline-Angus Co., Indianapolis, has developed a new line of graphic recording instruments. Typical of new features which characterize these units are the clocks employed for driving the charts. These interchangeable clock units can be dropped out quickly and replaced in the field without putting the instrument out of service.

The new instruments are available in portable, switchboard flush, switchboard front and wall type cases. In addition, all but the portable are made in double and twin types which consist of two recorders in one case. The accompanying illustration depicts a twin switchboard graphic meter with covers removed.

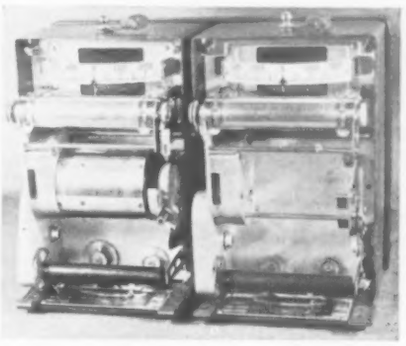
Comprising the entire line are 22 different kinds of recording instruments including ammeters, wattmeters, voltmeters, all of the alternating and direct-current types; and recorders for registering vacuum, high and low pressure, frequency and power factor, time and production, motion and position, as well as water level.

◆

Uses Welded Construction In New Presses

Henry & Wright Mfg. Co., Hartford, Conn., is manufacturing a new line of double crank straight-sided welded steel presses, which includes the 350-ton unit depicted in the accompanying illustration. This press is the shrunk-in tie rod type with the bed, uprights, crown, slide and twin gears constructed of welded steel.

The multiple plate friction clutch

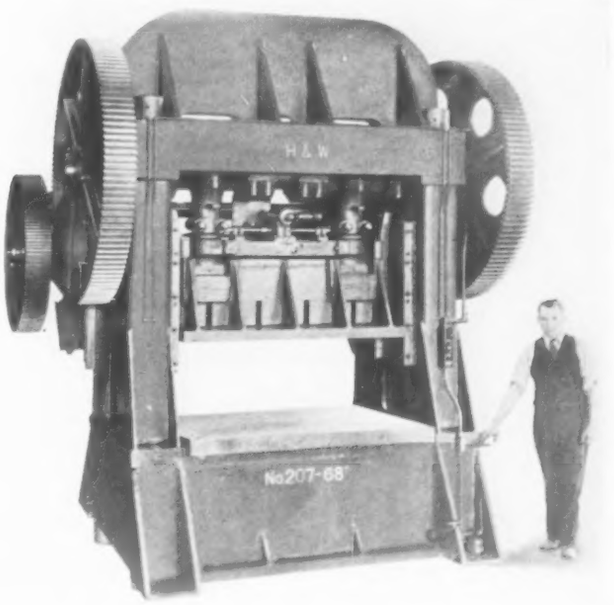


Easterline-Angus switchboard graphic meter with covers off

embodied in the design is operated electrically, the controls being so arranged that four methods of operation are available. A master control box is located at a convenient height on the right-hand uprights and contains two push buttons, one being the emergency stop button to instantly stop the press at any portion of the stroke. The second button is in series and is used to jog or inch the slide.

In addition to these push buttons, there is a third button located in the master control box which can be turned to either of two positions. One position is for single stroke operation, the press stopping automatically at the top of each stroke; the other position allowing the press to operate continuously. Four push buttons are located on the knockout bar, being in series with a treadle button so that they must be depressed before the clutch can be engaged.

DOUBLE crank straight-sided welded steel press of 350-ton capacity built by Henry & Wright Mfg. Co. embodies control features which insure complete safety of operators at all times. An internal expanding brake operates in conjunction with the clutch



Today's Problem

LAZY smoke stacks are a symbol of today's business problem. They indicate a business condition that encourages low stocks on hand, holds up production and raw material schedules and invites hurry-up, last-minute orders.

Granite City Steel Co. meets today's problem perfectly for the sheet steel jobber. Adequate warehouse stocks of sheets and plates are ready for immediate shipment from Granite City. And the location of Granite City Steel Co., only 20 minutes from Saint Louis, and served by 29 railroads and the Mississippi River, assures better service to the Mississippi Valley, the West, and the Southwest.

Chicago, Dallas
Kansas City

SINCE
GRANITE CITY STEEL
1878

St. Louis, St. Paul
Salt Lake City

GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE

•

GRANITE CITY STEEL CO
GRANITE CITY, ILLINOIS

Support of Market Too Much for Shapes

Four-week Awards over 100,000 Tons, but Other Products a Drag — Steel Rate 17 Per Cent — Finished Steel Prices Generally Firm

STRUCTURAL steel bookings of 26,361 tons in the past week bring the aggregate for the past four weeks up to 109,713 tons, which is 50 per cent above the average rate of awards thus far in 1932 and the largest volume for any consecutive four weeks in almost a year.

In these orders, which overshadow those for all other steel products, public work continues to dominate. Last week's awards include 12,000 tons for the interstate commerce commission and department of labor building at Washington, considered closed. Pending work, headed by 5000 tons for a postoffice at Minneapolis, also is largely public in character. Active projects at Buffalo total more than 10,000 tons.

Only an adjustment of financial details, assured through a Reconstruction Finance Corp. loan, stands between fabricators and the release of 50,000 tons for the Pennsylvania railroad's eastern electrification. Included are 15,000 tons for the Newark terminal, 5800 tons for a bridge at Trenton, 3700 tons for an express station in Philadelphia. A portion of 39,000 tons of steel poles and 31,000 tons of cross arms, signal bridges and substations also is to be released.

Other than for structural material, demand for finished steel has subsided to a degree reminiscent of the summer lull of preceding years—a valley which producers had hoped to avoid because they did not ascend to a spring peak.

Railroads are taking figures on some scattered second-half year requirements. Automobile manufacturers other than Ford are curtailing rapidly and are close to the point of offsetting Ford expansion. Ford orders for steel are the largest in practically a year, but the rest of the industry leaves a void that is more noticeable.

As a result, steelmaking operations in the week ended June 11 eased off four points to 17 per cent. In May, when the daily production of ingots was 42,593 gross tons, the industry was at 20.11 per cent of capacity. This week a slight decrease is indicated, and June may break through the previous low of modern steelmaking—the 36,713-ton rate of July, 1921.

Buffalo at 10 per cent, eastern Pennsylvania at 12½, Pittsburgh at 17, Chicago at 18, Youngstown at 19, Birmingham at 23, Cleveland at 29—such is the roll call of operations for the week ended June 11. Staggered schedules prompt hope for a slight rise at Buffalo this week, but Cleveland and Pittsburgh will be lower.

Despite the decline of 2½ points in production in May, on the basis of American Iron and Steel institute figures, unfilled orders of the United States Steel Corp. as of May 31 showed a loss of 149,764 tons or 6.44 per cent. Bookings of the Corporation on May 31 totaled 2,177,162 tons.

Sentiment, however, has not sunk to a 17 per cent basis. Producers make no effort to gloss the situation over, yet remain convinced that June and early July will prove the low point and that the extreme recession in operations only hastens the upturn.

Tin plate mills, averaging 50 per cent operations, are in better position than the rest of the industry even if part of current output is being stocked. More barge work is coming out at Pittsburgh. Two Detroit automobile manufacturers have broadened their releases for wire. The Steel corporation late this month will put some Great Lakes ore carriers into service.

Except for certain large buyers at Detroit, finished steel prices are firm. Save where new price methods have been introduced, as in cold-finished steel and hot-rolled strip, second quarter levels are being extended into the third. Ferromanganese has been reduced $7, with a comparable lowering of spiegeleisen probable.

The steelworks scrap composite of STEEL is off 4 cents this week to $6.71, but the iron and steel composite is unchanged at $29.56 and the finished steel composite at $47.62.

Composite Market Averages

	June 11	June 4	One Month Ago May, 1932	Three Month Ago March, 1932	One Year Ago June, 1931	Ten Years Ago June, 1922
Iron and Steel Composite	$29.56	$29.56	$29.62	$29.61	$31.02	$36.96
Finished Steel Composite	47.62	47.62	47.62	47.09	48.60	53.29
Steelworks Scrap Composite	6.71	6.75	7.03	7.94	8.84	14.60

Iron and Steel Composite:—Pig iron billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	June 11, 1932	May 1932	March 1932	June 1931
PIG IRON				
Bessemer, del., Pittsburgh	$16.13	16.13	16.76	18.26
Basic, valley	15.00	15.00	15.00	17.00
Basic, eastern del., eastern Pa.	14.50	15.00	15.75	17.00
No. 2 foundry, del. Pittsburgh	16.26	16.16	16.51	18.26
No. 2 foundry, Chicago	16.00	15.60	16.50	17.50
*Southern No. 2, Birmingham	11.00	11.00	11.00	12.00
**No. 2X, Virginia furnace	18.00	18.00	18.00	18.25
**No. 2X, Eastern del. Phila.	14.76	15.13	15.76	17.76
Malleable, valley	14.50	15.00	15.50	17.00
Malleable, Chicago	16.00	15.60	16.50	17.50
Lake Superior, charcoal, del. Chi.	23.04	23.04	23.04	27.04
Gray forge, del. Pittsburgh	15.63	15.63	16.13	17.63
Ferromanganese, del. Pittsburgh	73.24	80.24	80.24	89.79

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

COKE				
Connellsville, furnace, ovens	2.00	2.15	2.25	2.40
Connellsville foundry, ovens	3.00	3.15	3.25	3.25
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	29.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	29.00
Billets, open-hearth, Pittsburgh	26.00	27.00	27.00	29.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00

	June 11, 1932	May 1932	March 1932	June 1931
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.60	1.55	1.65
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.81	1.94
Iron bars, Chicago	1.65	1.65	1.70	1.70
Shapes, Pittsburgh	1.60	1.60	1.55	1.65
Shapes, Philadelphia	1.75	1.75	1.66	1.76
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.55	1.65
Tank plates, Philadelphia	1.79½	1.79½	1.69½	1.85¼
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.70	1.85
†Sheets, No. 24, hot, ann., Pitts.	2.20	2.20	2.20	2.15
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.80	2.80
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	2.00
†Sheets, No. 24, hot ann., Chi.	2.35	2.35	2.35	2.40
Sheets, No. 24 galvan., Chi.	3.00	3.00	3.00	2.95
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.80
Tin plate, per base box, Pitts.	4.75	4.75	4.75	5.00

†Comparisons are with old classification No. 24 black sheets.

SCRAP				
Heavy melting steel, Pitts.	$9.00	9.75	10.25	10.30
Heavy melting steel, eastern Pa.	6.25	6.25	7.35	8.75
Heavy melting steel, Chicago	6.00	6.20	6.75	8.50
No. 1 wrought, eastern Pa.	6.50	7.75	9.00	10.50
No. 1 wrought, Chicago	5.25	5.25	6.25	8.25
Rails for rolling, Chicago	8.00	8.25	9.50	10.90

Sheets

More Mills Extend Prices For Third Quarter — Few Inquiries —Current Orders at Low Level

SHEET PRICES, PAGE 43

Pittsburgh—The past week evidenced no increase in demand for sheets, with a little automotive activity. Automobile sheet prices still are irregular and producers feel that any effort toward price readjustment for next quarter should be more in elimination of concessions rather than an increase over present quotations. Consumer inquiry is lacking for third quarter although there is every indication that present prices will be reaffirmed. Mill operations are slightly easier at about 20 to 22 per cent. Black sheets hold at 2.20c, base, and galvanized at 2.85c. Blue annealed sheets appear firm at 1.70c.

New York—One leading mill has reaffirmed prices for third quarter on all grades, including full finished. Demand is listless.

Philadelphia—Definite prices on full finished sheets for third quarter have not been announced, but prices for ordinary grades have been reaffirmed. Buying remains exceedingly sluggish.

Youngstown, O.—Increasing irregularity in sheet mill operation is being ascribed to similar operating irregularities in the automotive industry. Partsmakers are tapering off demands for sheets. Ford is expanding operations, and Chrysler is doing fairly well, but a growing proportion of other builders are scaling down the volume of their steel needs. Generally, sheet prices are unchanged in the valley market.

Cleveland—Since the announcement in STEEL last week that black sheet prices had been reaffirmed at 2.20c, Pittsburgh, and galvanized at 2.85c, for third quarter, similar action has been taken by the majority of makers on all other common grades. Some mills have reaffirmed current prices on autobody, furniture, and enameling stock, and others are preparing to do so. Comparatively little of recent Ford sheet purchases has come to local mills. More activity is noted among makers of low-price refrigerators; demand from furniture makers is light, and practically nothing is being received from barrel makers.

Detroit Steel Barrel Co., Detroit, took 500 galvanized steel drums for Panama, at $44.90 delivered, on bids of May 18.

Buffalo—Sheet mills continue to operate at about 25 per cent. The prospect is for operations at or near this level during the remainder of June.

Cincinnati—Production at district sheet mills has receded below 30 per cent, with the shrinking in several consuming lines, notably electric refrigerators.

Chicago—Sheet orders are light and unimproved from the low volume of recent weeks. Prices remain to be established for third quarter, but are expected to be continued on the basis of recent levels on the common finishes. Mill operations continue around 20 per cent.

St. Louis—The Granite City Steel Co., leading producer in this district, has reaffirmed its current prices for third quarter. Some inquiry for sheets has developed and absolute replacement requirements are expected to increase demand in the next few months.

Birmingham, Ala.—An early recuperation in demand for sheets is not expected. Buying in the agricultural areas continues extremely light.

San Francisco — Weirton Steel Co., Weirton, W. Va., bidding $12,270.60, f. o. b., and Newport Rolling Mill Co., Newport, Ky., $14,655, delivered, are low on 199 tons of pickled and oiled sheets, 0.025-inch thick, for Mare Island, Calif., navy yard, bids June 7. There are 17,775 sheets, 25x100, 38x96 and 32x96 inches, in the schedule.

Current Finished Steel Prices

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, del.	1.70c
New York, del.	1.90c
Birmingham, base	1.70c
Philadelphia, del.	1.86c

BLUE ANNEALED NO. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, del.	2.01c
New York, del.	2.05c
St. Louis, delivered	2.07½c
Birmingham	1.85c
*San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED NO. 24

Pittsburgh, base	2.20c
Gary, Ind. Harbor, base	2.30c
Chicago, del.	2.35c
New York, del.	2.55c
Philadelphia, del.	2.51c
Birmingham, base	2.35c
St. Louis, del.	2.57½c
*San Francisco, c.i.f.	2.85c

GALVANIZED NO. 24

Pittsburgh, base	2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, del.	3.00c
Philadelphia, del.	3.16c
Birmingham, base	3.00c
St. Louis, del.	3.22½c
*San Francisco, c.i.f.	3.50c

AUTOMOBILE NO. 20

Pittsburgh, base	2.80c to 2.90c

FURNITURE

Pitts., No. 10 heavy	2.65c
Pitts., No. 20 light	3.15c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.40c to 2.50c
Gary, base	2.50c to 2.60c
St. Louis, del.	2.77½c to 2.82½c

HEAVY COLD ROLLED NO. 10

Pittsburgh, base	2.25c
Gary, Ind. Harbor, base	2.35c
Chicago, del.	2.40c
Philadelphia, del.	2.56c
New York, del.	2.60c
St. Louis, del.	2.62½c

COLD ROLLED NO. 20

Pittsburgh, base	2.75c
Gary, Ind. Harbor, base	2.85c
Chicago, del.	2.90c
Philadelphia, del.	3.06c
New York, del.	3.10c
St. Louis, del.	3.12½c

TIN AND TERNE PLATE
Per 100-pound box, Pittsburgh

Tin plate, coke base	$4.75
Long ternes, 24, unassort.	3.00c

Gary, Ind., base 10 cents higher

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)
F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95
(Per pound)	
Polished staples	2.50c
Galvanized staples	2.75c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing, (9-11 ga.)	$55.00
(12½ ga. and lighter)	$60.00
(To Manufacturing Trade)	
Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.79½c
New York, delivered	1.90c
Boston, delivered	2.02c
Chicago, base	1.70c
Cleveland, del.	1.78½c
Birmingham, Ala., base	1.75c
Coatesville, Pa., base	1.70c
*Pacific Coast, c.i.f.	2.00c
St. Louis, del.	1.97½c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.75c
New York, del.	1.87c
Boston, del.	2.00½c
Chicago, base	1.70c
Cleveland, del.	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
*Pacific Coast, c.i.f.	2.10c
*Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.90c
Boston, del.	2.02c
Pittsburgh, cold finish	1.75c
Pittsburgh, forg. qual.	1.85c
*San Francisco, c.i.f.	2.10c

RAIL STEEL

Chicago Heights	1.50c
Eastern mills	1.30c

IRON

Chicago, base	1.65c
New York, delivered	1.85c to 1.95c
Philadelphia, delivered	1.86c to 1.96c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts., billet cut lengths	1.75c
Pitts., stock lengths, mill	1.60c
*Chi., billet	1.60c to 1.70c
Chi., rail steel	1.45c
Chi., rail steel, road, bridge and culvert	1.45c
Philadelphia, cut lengths	2.06c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Min. 10,000 lbs. of kind and grade

Pittsburgh	1.70c
Chicago, Buff., Cleveland	1.75c
Detroit	1.90c
Eastern Michigan	1.95c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel
Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to 6.75 off
Carloads, Chicago dist.	7.00 to 7.50 off

Alloy Steel

Hot Rolled—F.o.b. Mills
Alloy Quality Bars, 2.65c, mill
(Differentials to various classes of consumers)

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo.	1.25-1.75 Ni. 1.05
2000	0.25	5100 .80 - 1.10	
2100	0.55	Cr.	0.45
2300	1.50	51.00 Cr.	
2500	2.25	spring	0.20
3100	0.55	6100 bars	1.20
3200	1.35	6100 Spring	0.95
3300	3.80	Cr., Ni., Van.	1.50
3400	3.20	Carbon Van.	0.95
4100 .15 to .25		9250 (flats)	0.25
Mo.	0.50	9250 (rds.,sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6 in., Pitts.	1.60c
Do, 6 1/16 to 24-in., Pitts.	1.50c
Hot strip to 6 in. Chi.	1.60c
Do, 6 1/16 to 24-in.	1.50c
Cooperage hoop, Pitts.	1.60c to 1.70c
Do., Chicago	1.70c to 1.80c
Cold-roll, strip, Pitts., Cleve.	2.00c
Worcester, 3 tons over	2.20c

Rails, Track Material

Standard rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	24.00 to 27.00
*Light rails, 25-45, mills	$32.00
Light rails, Chicago	$36.00
Angle bars, mills	2.75c
Spikes, railroad, mills	2.60c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.60c
Spikes, boat, barge, Pitts.	2.90c
Track bolts, Chicago	3.50c
Do, standard, jobbers	73 off list
Track bolts, Chicago	3.50c
Tie plate, mills	$37.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off
Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off
Upset, 1 in. and smaller ..... 80-10-5 off
Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do. less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Rivets

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleve.	70, 10 and 5 off

Bars

Automotive Buying Shows Little Gain—Other Users Cover Only Current Needs—Prices Steady

BAR PRICES, PAGE 43

Chicago — Bar demand from the automotive industry recently has been slightly more active, but buying is spotty and requirements of other consumers are small. The market is expected to continue 1.70c, Chicago, on soft steel bars into third quarter. Bar iron is moving slowly for railroad work, and the market is fairly steady at 1.65c. Rail steel bars continue 1.50c, Chicago Heights. Demand from farm implement companies is quiet and unchanged, with no early improvement in prospect.

Philadelphia—Commercial steel bar prices are firm at 1.60c, Pittsburgh, with little test of this price for third quarter. Current buying appears as dull as at any time this year. Common iron bars are quiet at 1.60c to 1.65c, Pittsburgh. Bids close June 16 on 92,000 feet of cold-drawn bar steel for the Frankford arsenal. The same station closes June 20 on 1,000,000 steel cores for 0.50 caliber bullets.

Pittsburgh—Third quarter coverage for soft steel bars may be obtained at 1.60c, Pittsburgh, but a formal trade announcement is yet to be made. Current ordering is still restricted and specifications close to the comparable rate during the first ten days of May. Alloy bars, however, appear to be in a better market and one producer reports receiving a fair volume of new orders last week. In spite of rumor of concessions in alloy bars, the 2.65c mill base appears firm.

Youngstown, O.—Common steel bar buyers continue chary of placing new business except for immediate requirements, although implement makers, concrete bar users and others are taking shipments fairly regularly. Cessation of road-building in Ohio now is having a disappointing effect upon bar mill output. Demand for alloy steel bars is beginning to taper from auto parts-makers. Common steel bars are 1.60c, Pittsburgh.

Cleveland—More makers have reaffirmed common steel bar prices at 1.65c, base, Cleveland, and 1.60c, base, Pittsburgh, for third quarter. Commercial forging steel is up 15 cents per 100 pounds, over base, and guaranteed quality up 25 cents. No forward demand is developing, and current sales continue light.

Niagara Searchlight Co., Niagara Falls, N. Y., has leased a site and will build a branch plant at Niagara Falls, Ont.

Tin Plate Operations Show Wide Variation

Tin Plate Prices, Page 43

Pittsburgh—Tin plate releases still are disappointing, and a fairly sizable proportion of the output, represented by current 50 per cent operation at tin mills, is being stocked. Operations vary widely, one large producer having reduced last week to 20 per cent, while another is holding at 80 per cent. The base price is $4.75 per box, and it is indicated this may be continued into the fourth quarter.

Youngstown, O.—Tin plate mills here have received additional specifications from canners. The mill operating average has been restored to around 50 per cent, to be continued well into July.

Cold-Finished Buying for Third Quarter Is Slow

Cold Finished Prices, Page 43

Pittsburgh — Cold-finished bar specifications appear somewhat less than during May. Although negotiations are being carried on no contracts have been closed for third quarter on the new price basis. In such scattered inquiry as is appearing, the 1.70c, Pittsburgh, single price appears quoted.

Plates

Tank Outlook Slightly Better—Most Mills Are Extending Prices for Third Quarter

PLATE PRICES, PAGE 43

Chicago — Plate orders for oil tank work are light despite a mild improvement in outlook. Little expansion work is looked for from the oil industry, but some increase in replacement construction is anticipated. Few inquiries are appearing from municipalities for elevated tanks, and orders are scattered. Railroads still are poor buyers of plates for repair work, and new car construction is entirely lacking. Plates generally continue 1.70c, Chicago.

New York—Most plate mills have not as yet opened books for third quarter, although the 1.70c, Coatesville, Pa., price will likely be named. Several hundred tons of plates are required for the New York Central viaduct here. The Buffalo Tank Corp., Buffalo, has been awarded 120 of the tanks for Wright field, Dayton, O., requiring 750 tons, or considerably less than originally estimated. Bids will be opened June 21 on a sizable tonnage of plates for East and West Coast navy yards. On 43 tons of plates for the Mare Island navy yard, Worth Steel Co., Claymont, Del., was low, with a price of 2.1075c, delivered. Youngstown Sheet & Tube Co., Youngstown, O., bid 1.5218c, f.o.b. works.

Philadelphia—Although official action is yet to be taken by most mills, little doubt prevails that 1.70c, Coatesville, Pa., will be extended on plates for third quarter. Indications point to the possible purchase of approximately 2000 tons of 30-inch steel pipe for the Panther Valley Water Co., Tamaqua, Pa. Miscellaneous plate buying is quiet.

Pittsburgh—Steel tank specifications show little change, but prospective barge work still is of some proportions. Dravo Contracting Co., Pittsburgh, will build two oil tank barges for a Nashville, Tenn., distributor which will take about 290 tons of plates and shapes. Midland Barge Co. will require 178 tons of steel for the two Memphis, Tenn., derrick barges it has closed on. Where desired, third quarter plate coverage may be obtained at 1.60c, Pittsburgh.

Cleveland—Although official announcement has not been made, the price 1.60c, base, Pittsburgh, now is generally expected to be reaffirmed for third quarter. Some mills report slightly better demand for small and miscellaneous lots.

Contracts Placed

750 tons, approximately 120 small tanks, Wright Field, Dayton, O., to Buffalo Tank Corp., Lackawanna, N. Y., bids May 25. Fifty of the

tanks, 25,000 gallon capacity at $575 each.

200 tons, two tank barges, for the Apex Oil Corp., Nashville, Tenn., to Dravo Contracting Co., Neville Island, Pittsburgh.

200 tons, 400,000-gallon elevated tank for Tallahassee, Fla., to Chicago Bridge & Iron Works, Chicago.

178 tons, two whirler derricks for United States engineers, Memphis, Tenn., to Midland Barge Co., Midland, Pa.

100 tons, plates and shapes, derrick boat for United States engineers, Huntington, W. Va., district, to Midland Barge Co., Midland, Pa., $27,560.

Unstated tonnage, 100,000 gallon tank and tower, Erie ordnance department, LaCarne, O., to Chicago Bridge & Iron Works, Chicago, $6940.

Contracts Pending

100 tons, tank and tower, veterans' hospital, Fayetteville, Ark.; bids June 21.

Unstated tonnage, east and west coast navy yards, bids opened in Washington, June 21.

Wire Users Show Little Interest; Price Is Firm

Wire Prices, Page 43

Chicago—Little interest is being shown in third quarter wire requirements, although producers will accept business for that period at unchanged prices of $2 for wire nails in carloads, and 2.25c for plain wire.

Worcester, Mass.—Wire prices are steady and unchanged. Mill operations are light with some departments slowing up gradually. Reaffirming of prices for third quarter offers little encouragement for consumers to cover ahead.

Philadelphia—With prices reaffirmed for third quarter, demand for nails and wire products continues inactive. Sellers generally see little improvement over the next several weeks.

John A. Roebling's Sons Co., Trenton, N. J., is low on 100,000 feet of 5/32-inch extra flexible tinned steel cable and 50,000 feet of 1/8-inch for the navy, Philadelphia, at $3825, delivered. Bids June 7.

New York—U. S. Steel Products Co. is low on 24 lengths (314 feet each) 2¼-inch diameter mainhoist cable for a dipper dredge, Panama, at $282.60 a length.

Pittsburgh—Wire and nail specifications are approximately holding the rate established in May. Nail orders are confined to occasional rush carloads, on which the $1.95 base is applied without much difficulty. Users of manufacturers wire are particularly quiet. A few third quarter contracts have been closed, but interest in that period is absent. Two Detroit automobile makers have issued some fairly good wire specifications. Prices of 2.20c for plain wire and 3.20c for spring wire are unchanged.

Railroads

Rail Buying Absent and Mill Backlogs Are Melting—Roads Cover Some Steel Needs

TRACK MATERIAL PRICES, PAGE 43

Pittsburgh—Railroad releases of track material and other railroad steel orders are light. Virtually the only new project is the double-track viaduct for the New York Central in New York city. Award of approximately 1200 tons of plates on the Wheeling & Lake Erie railroad's gondola order has been confirmed to a Pittsburgh district mill. Demand for light rails is negligible, with the $32 price most general.

Chicago—Releases from railroads for track material are slightly lower, and with no new business in early prospect the outlook is dull. Rail backlogs continue to decline and production is at a low level. Repairs are confined to necessary work. Chicago & North Western has closed the major portion of its locomotive and car shops here for an indefinite period. The Wabash railroad is figuring on six air conditioning units.

Freight car loadings of six leading railroads in this district during May were 30 per cent lower than a year ago, compared with a decline of 23 per cent in loadings for the first five months from the 1931 total.

New York—New York Central closes bids June 21 on third quarter requirements of steel wheels.

Philadelphia—The Pennsylvania railroad opened bids June 9 on its regular requirements of structural steel. No specific amount was mentioned. Bids were taken the same day on rough steel tires, not exceeding 600 tons, by the same road.

Locomotives Placed

Midland Continental, one 60-ton-gasoline-electric locomotive, to Whitcomb Locomotive Co., Rochelle, Ill.

Locomotives Pending

Chief, army engineers, Washington, one 30-ton gasoline-electric drive locomotive; bids June 15.

Bolt, Nut Third Quarter Buying Slow To Start

Bolts, Nuts, Rivets Prices, Page 43

Pittsburgh—Inasmuch as current specifications for bolts, nuts and rivets show a weaker trend inquiry for next quarter is light. Under such conditions local producers, while intimating that current prices of 75 off list for bolts and nuts and 2.25c for large rivets will be reaffirmed, have made no announcements.

Chicago—Bolt, nut and rivet specifications are in unchanged volume. Demand from the automotive industry is quiet and unimproved, and jobbers who added to stocks prior to the last increase in prices have had little occasion to make additional purchases. Requirements of farm implement builders are light. Third quarter contracts will be issued soon, with prices unchanged.

Cleveland—Volume of business continues at about the May rate. Jobbers are expected to buy a little more liberally before the end of June. Automotive orders are restricted mainly to the three active builders. As indicated previously, prices have been reaffirmed for third quarter.

Steel Corp. Loses 6.44 Per Cent in Unfilled Orders

New York—A new low in unfilled bookings of the United States Steel Corp. was established as of May 31, when a decline of 149,764 tons was registered. The tonnage at the end of April was 2,326,926 tons and at the end of June 2,177,162 tons. The loss was 6.44 per cent. Comparisons follow:

	Unfilled orders	Net change	Per cent change
1931			
Jan. 31	4,132,351	188,755+	4.78+
Feb. 28	3,965,194	167,157—	4.04—
Mar. 31	3,995,330	30,136+	0.73+
Apr. 30	3,897,729	97,601—	2.24—
May 31	3,620,452	277,277—	7.11—
June 30	3,479,323	141,129—	3.89—
July 31	3,404,816	74,507—	2.14—
Aug. 31	3,169,457	235,359—	6.91—
Sept. 30	3,144,833	24,624—	0.77—
Oct. 31	3,119,432	25,401—	0.30—
Nov. 30	2,933,891	185,541—	5.94—
Dec. 31	2,735,353	198,538—	6.77—
1932			
Jan. 31	2,648,150	87,203—	3.19—
Feb. 29	2,545,629	102,521—	3.88—
Mar. 31	2,472,413	73,216—	2.87—
Apr. 30	2,326,926	145,487—	5.88—
May 31	2,177,162	149,764—	6.44—

Structural Shapes

Awards Continue Heavy—109,000 Tons in Four Weeks—Large Government Contracts — Pennsylvania Railroad Work Now Expected To Speed Up—Details of Plans

STRUCTURAL SHAPE PRICES, PAGE 43

Philadelphia — Structural fabricators are hopeful that the Pennsylvania railroad will soon complete all financial arrangements whereby its electrification and general expansion program will go forward more actively. It is estimated approximately 50,000 tons of structural work, or a little less than 50 per cent of tonnage let for work not already completed, remains to be released. Of the larger projects for which contracts have been let but held up are approximately 15,000 tons for the Newark, N. J., terminal development, 5800 tons for a bridge at Trenton, N. J., 4400 tons for a bridge at Washington and about 2200 tons for a bridge at Passaic, N. J. In addition are 3700 tons for an express station in this city. Work also is to be released against a portion of about 39,000 tons of poles, and approximately 31,000 tons of cross arms, rods, brackets, signal bridges and substations.

Boston—Structural lettings are light. Bids close June 30 on a postoffice at Bridgeport, Conn. taking close to 1500 tons.

New York—Structural steel lettings are restricted mainly to public works. With the reported award of 12,000 tons for the postoffice and interstate commerce building, Washington, one Pittsburgh fabricator is understood to have taken its third large Washington government job, the three totaling about 30,000 tons.

Pittsburgh — Sheet steel piling is more in demand, with federal work at down-river points predominating. The Memphis, Tenn., engineers will require a large tonnage of piling for three points on the Mississippi river. A Pennsylvania state letting June 16 includes a Beaver, Pa., bridge, which will require about 1400 tons of wide-flange material.

Buffalo—Outlook for structural steel demand continues to improve. In addition to about 10,000 tons recently mentioned as pending in western New York it now appears a local private hospital is ready to go ahead with a building project for which approximately 2000 tons will be required.

Cleveland—A good, steady flow of small orders is being received by structural fabricators, but no new large projects have developed. Bids are to be taken July 15 by the Cuyahoga county commissioners on abutments for the Main street bridge, the steel portion of which will require 6000 to 7000 tons of shapes. Fabricators do not expect action on the Cleveland postoffice superstructure until fall. Fabricated steel prices are a little firmer. Some makers indicate plain shapes will be reaffirmed at 1.60c, base, Pittsburgh, for third quarter.

Chicago — Shape inquiry continues at its recent quiet rate, with public work projects in the majority. A few private inquiries are appearing, but awards are small. Plans are being revised on the General Motors building for the Chicago exposition, and award of the steel is deferred.

Contracts Placed

12,000 tons, buildings, department of labor and interstate commerce commission, Washington, reported to Fort Pitt Bridge Works Co., Pittsburgh. Not confirmed.

1400 tons, South river bridge, Annapolis, Md.; 1200 tons to Belmont Iron Works, Philadelphia, and 200 tons to Bartlett & Hayward, Baltimore.

1000 tons, cableways for Six Companies, Boulder City, Nev., to Consolidated Steel Corp., Los Angeles.

950 tons, bascule bridge, Manistee, Mich., to R. C. Mahon Co., Detroit.

850 tons, bridge for Missouri Pacific railroad, Myrtle, Ark., to Stupp Bros. Bridge & Iron Co., St. Louis.

800 tons, garage, Philadelphia Savings Fund, Philadelphia, awarded through George A. Fuller, general contractor, to American Bridge Co., Pittsburgh.

680 tons, powerhouse, Vernon, Calif., to Consolidated Steel Corp., Los Angeles.

666 tons, gates for Hoover dam, Boulder City, Nev., to Consolidated Steel Corp., Los Angeles.

600 tons, bridges, Kentucky; 300 tons to Vincennes Bridge Co., Vincennes, Ind., and 300 tons to International Steel & Iron Co., Evansville, Ind.

500 tons, two bridges, Virginia railroad, to American Bridge Co., Pittsburgh.

500 tons, science building, Georgetown university, Washington, to Lehigh Structural Steel Co., Allentown, Pa.

500 tons, bridges for Wabash railroad, to American Bridge Co., Pittsburgh; McClintic-Marshall Corp., Bethlehem, Pa.; Stupp Bros. Bridge & Iron Co., St. Louis, and Mississippi Valley Structural Steel Co., Decatur, Ill.

450 tons, bridge, Guadalupe and Bexar counties, Texas, to Houston Structural Steel Co., Houston, Tex.

446 tons, postoffice and court house, Meridian, Miss., to Virginia Bridge & Iron Co., Birmingham, Ala.

400 tons, garage, St. Ann avenue, Bronx, New York, to George A. Just Co., Long Island City, N. Y.

400 tons, steel troughs and lamppost standards, west side elevated highway, New York, to Koppel Industrial Car & Equipment Co., Koppel, Pa., through Seaport Contracting & Supply Co., New York; Poirier & McLane Corp., general contractor.

400 tons, bridge over Arkansas river, Blackburn, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

350 tons, seaplane runway, Pearl Harbor, T. H., to unnamed interest.

300 tons, mailing room, Kansas City, Mo., to Kansas City Structural Steel Co., Kansas City.

275 tons, St. Joseph's hospital, Pasadena, Calif., to Consolidated Steel Corp., Los Angeles.

265 tons, 4-story building, Springfield Safe Deposit & Trust Co., Springfield, Mass., to G. Haarmann & Co. Inc., Holyoke, Mass.; A. E. Stephens Co., Springfield, general contractors.

265 tons, building, 106th street, New York, to Harris Structural Steel Co., New York.

260 tons, Kress store, East Orange, N. J., to Goeller Co., Newark, N. J.

255 tons, Bedford Y.M.C.A. addition, Brooklyn, N. Y., to George A. Just Co., Long Island City, N. Y.

250 tons, Montgomery locks, Beaver, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

217 tons, bridge in San Juan county, New Mexico, to unnamed interest.

200 tons, highway bridge, Cedar Hill, N. Mex., to Minneapolis-Moline Power Implement Co., Minneapolis.

197 tons, Hanchette apartments, San Francisco to Judson-Pacific Co., San Francisco.

175 tons, Mercantile library, New York, to Montgomery Iron & Steel Co., Philadelphia.

160 tons, state bridge, Bennett's Creek, Virginia, to Roanoke Iron & Bridge Works Inc., Roanoke, Va.

150 tons, sheet piling, westerly sewage disposal plant, Cleveland, to Carnegie Steel Co., Cleveland.

100 tons, county bridge, Angola, N. Y., to R. S. McManus Steel Construction Co., Buffalo.

100 tons, Veteran's hospital, Roseburg, Oreg., to Poole & McGonigle, Portland, Oreg.

Unstated tonnage, material and equipment for jacking and rolling system, Pacific Lock, Panama, to Atlas Car & Mfg. Co., $6388.56, bids May 11, class 1.

Awards Compared

	Tons
Awards, week ended June 11	26,361
Awards, week ended June 4	30,843
Awards, week ended May 28	31,886
Awards, this week in 1931	61,284
Av. weekly awards, 1931	34,236
Av. weekly awards, 1932	15,809
Av. weekly awards, May	17,402
Awards to date, 1931	940,613
Awards to date, 1932	379,438

Contracts Pending

5000 tons, postoffice, Minneapolis.

3000 tons, estimated, postoffice, Rochester, N. Y.; bids July 8.

2000 tons, for Sisters' hospital, Buffalo.

revival of 1931 project; contract now pending.

2000 tons, state capitol building, Bismarck, N. Dak.

1500 tons, postoffice, Bridgeport, Conn.; bids June 30.

1400 tons, state bridge, Beaver county, Pennsylvania; bids June 16, as noted in a previous issue.

1400 tons, New Jersey state highway department work, Newark, N. J.

1200 tons, highway bridges, various locations, New York state.

1200 tons, additional cableways for Six Companies, Boulder City, Nev., to be purchased later in year.

1200 tons, state bridge, Seneca, Ill.; Wisconsin Bridge & Iron Co., Milwaukee, low.

900 tons, further section, west side improvement, New York Central railroad, New York.

600 tons, bridge, Taylor county, Wis.

500 tons, three bridge spans, Kentucky, for Illinois Central railroad.

490 tons, additional, piling and 80 tons beams, easterly sewage disposal plant, Cleveland; bids June 23.

450 tons, bridge over Fox river, Illinois.

450 tons, shapes and bars, postoffice, Palm Beach, Fla.; Rohan Co., Garden City, Long Island, N. Y., low on general contract.

360 tons, state bridge, between Washington and Greene counties, Pennsylvania; bids asked.

350 tons, bridge, East Bethlehem, Pa.

325 tons, state bridges, Maine.

300 tons, bridge over Squaw Creek, Mendocino county, Calif., for state; plans being prepared.

300 tons, shapes and bars, postoffice, Kenosha, Wis.; Anderson & Co., Chicago, low on general contract.

250 tons, veterans' hospital, Wichita, Kans.

225 tons, tunnel structures for Hetch Hetchy project, San Francisco; bids opened.

225 tons, factory, Sigurd, Utah.

200 tons, postoffice, Marysville, Calif.; plans being prepared.

200 tons, warehouse, Cambridge, Mass.; Jordan & Marsh Co., Boston.

160 tons, state bridge, between Tioga and Lycoming counties, Pennsylvania; bids asked.

150 tons, state bridge, Daughin and Northumberland counties, Pennsylvania; bids asked.

150 tons, postoffice, addition, Quincy, Mass.

150 tons, postoffice, Salem, Mass., Louis B. Cadario & Sons, Boston, low, $185,000, as specified; $166,500, limestone base course instead of granite.

140 tons, bridges, Cotton county, Okla.; Oklahoma highway commission, bids June 14.

125 tons, piling, bulkhead, United States engineer, Savannah, Ga.; bids June 27.

125 tons, postoffice, Glen Cove, Long Island, N. Y.; Joseph Garry Co., New York, low.

120 tons, addition, postoffice, Joliet, Ill.; George E. Vonville, Calumet City, Ill., low.

120 tons, state bridge, Allegheny county, Pennsylvania; bids asked.

110 tons, postoffice, El Centro, Calif.; bids June 15.

100 tons, warehouse Waldorf Co., Boston.

100 tons, approximately, state bridge Columbia county, Pennsylvania; bids asked.

100 tons, piling, bulkhead, Calvert county, Md.

100 tons, barracks, Hamilton field, Calif.; bids June 20.

Concrete Bars

Inquiry in Eastern Districts Heavier—2300 Tons Placed For Two Washington Postal Department Buildings — Bridge and Highway Work Continues Fairly Active

REINFORCING BAR PRICES, PAGE 43

Chicago—Reinforcing bar activity is made up of small lots, mainly for road work and other public construction. Competition for the small volume of business is bringing pressure on prices, and weakness is noted in quotations on both billet and rail steel bars. Billet bars generally are 1.65c, with some business going at 1.60c and less. Rail steel material usually is 1.45c.

Boston — Reinforcing bars contracts are small. Several New England states are planning heavier highway and bridge construction. Prices on larger tonnages are easy.

New York—Fresh inquiry for reinforcing steel is heavier than current lettings, with the result pending tonnage is growing. Two additional highway projects are closing for New Jersey, June 27. New York state bridge and highway work is more active. Partial requirements for a port project, Cartagena, Colombia, have been placed, some going to European mills. About 2300 tons were placed for two Washington projects.

Buffalo — State contracts have been or are about to be awarded on nearly 50 miles of concrete highways for the up-state region.

Philadelphia—Approximately 800 tons of reinforcing bars for the Scranton, Pa., high school have been placed with the Kalman Steel Corp. and 1200 tons are reported to have been placed by McCloskey & Co., this city, general contractors, with the Sweet's Steel Co., Williamsport, Pa., for the postoffice building in Washington.

Pittsburgh — Stock lengths of reinforcing bars appear firmer at 1.60c, Pittsburgh, but buying still is restricted. An eastern interest has closed on steel for the Scranton, Pa., high school.

Cleveland—Concrete bar awards and new projects immediately in view are light. Bids will be taken July 15 by the Cuyahoga county commissioners (Cleveland) on part of the concrete work for the Main street bridge, but bar tonnage required has not yet been figured. For the Valvecker Packing Co.'s plant at Piqua, O., 100 tons are required in addition to the 470 tons of shapes previously noted. Paterson-Leitch Co. has been awarded 100 tons for the westerly sewage disposal plant here.

Awards Compared

	Tons
Awards, week ended June 11	5,891
Awards, week ended June 4	4,961
Awards, week ended May 28	4,494
Awards, this week, 1932	6,645
Av. weekly awards, 1931	6,808
Av. weekly awards, 1932	4,535
Av. weekly awards, May	3,812
Awards, to date, 1931	174,069
Awards to date, 1932	108,853

Contracts Placed

1200 tons, postoffice building, Washington, to Sweet's Steel Co., Williamsport, Pa., through McCloskey & Co., Philadelphia, general contractor.

1100 tons, addition, postoffice, Washington, to Knoxville Iron Co., Knoxville, Tenn.; B-W Construction Co., Chicago, general contractor.

800 tons, high school, Scranton, Pa., to Kalman Steel Corp., Bethlehem, Pa., through William Steele & Sons, Philadelphia, general contractors.

630 tons, federal hospital, Baltimore, to Kalman Steel Corp., Bethlehem, Pa.; W. E. O'Neil Construction Co., Chicago, contractor.

385 tons, highway, Eastern Parkway connection, near Crompond road to Putnam county line, Yorktown, N. Y., to Concrete Steel Co., New York; A. E. Ottavaiano Inc., Croton-on-Hudson, N. Y., general contractor.

375 tons, industrial buildings for dirigible base, Sunnyvale, Calif., to Pacific Coast Steel Corp., San Francisco, through Robert E. McKee & Co., Los Angeles.

220 tons, partial requirements, port development, Cartagena, Colombia, to United States Steel Products Co., New York. Frederick Snare Corp., New York, general contractor.

200 tons, powerhouse, Vernon, Calif., to unnamed interest.

150 tons, bridge and road work, Brownstown, Ind., to Highland Iron & Steel Co., Terre Haute, Ind.

150 tons, seaplane runway, Pearl Harbor, T. H., to unnamed interest.

140 tons, bridge in San Juan county, N. Mex., to unnamed interest.

130 tons, junior high school, Twelfth avenue, Sacramento, Calif., to Truscon Steel Co., San Francisco.

111 tons, sewage disposal plant, Norwalk, O., to Pollak Steel Co., Cincinnati; H. G. Christman & Burke, Detroit, general contractor.

100 tons, bank building, including vaults, Springfield, Mass., to Northern Steel Co., Boston, and Truscon Steel Co., Youngstown, O.

100 tons, concrete bars and shapes, per-

sonnel quarters and garage, marine hospital, New Orleans, to Connors Steel Co., Birmingham, Ala., and James R. Sutten, New Orleans.

100 tons, westerly sewage disposal plant, Cleveland, to Paterson-Leitch Co., Cleveland.

Contracts Pending

725 tons, tunnel structures, Hetch Hetchy project, San Francisco; bids opened.

300 tons, easterly sewage disposal plant, Cleveland, bids June 23.

250 tons, highway, route 42, section 7, Grenlock to Woods Corner, Camden and Gloucester, N. J.; bids June 20, state highway commission, Trenton, N. J.

200 tons, state bridge, Annapolis, Md.

125 tons, highway, route 29, section 1-B, Hilldale Place to Elizabeth river, Union county, New Jersey, bids June 27.

120 tons, highway work, Contra Costa county, Calif.; bids opened.

110 tons, highway, route S-28, section 1-A, Middlesex county, New Jersey; bids June 27.

100 tons, building, Valvecker Packing Co., Piqua, O.

100 tons, highway, Harrison, N. Y.

Semifinished Steel Advances Are Untested

Semifinished Prices, Page 50

Pittsburgh — Semifinished steel specifications hold to the rate noted early in May. One producer has experienced increased shipments and new orders on forging billets so far this month with the price well maintained on that material at $33, base. There has been no inquiry as yet for third quarter sheet bars, billets or slabs which currently are $26, Pittsburgh. Prices at $2 a ton up are being solicited for the third quarter. Wire rods are firm at $37, base.

Youngstown, O.—While some uncertainty has been injected into the third quarter price situation on billets, sheet bars and slabs by the announced intention of a Chicago maker to advance its price $1 a ton, instead of $2 as named by some northern and eastern Ohio mills, the latter seem inclined to adhere to their original intention. Purchases are still restricted.

Cleveland—The advance of $2 a ton in sheet bars, billets and slabs for third quarter, announced recently by a few sellers, does not appear to be conclusive at this time. Some makers say they will only follow in the event such an advance actually holds; others, that they have not decided their price policy for third quarter, but indicating they likely will reaffirm semifinished steel prices, as they have finished steel. Weakness in forging billet prices is reported in some instances. Consumers are not making forward commitments.

Pipe

Most Cast Lots Are Under 100 Tons—East Texas Oil Field May Buy—Prices Are Weak

PIPE PRICES, PAGE 58

New York—Cast pipe buying and inquiry have slowed further. The bulk of pending requirements is for state projects. The new Newark, N. J., subway section will take a small tonnage and some small lots are being placed from time to time for New York subway work. Prices are weak throughout the East, a small job at Washington last week bringing out $26.24 delivered, as low.

Boston—Except for approximately 1000 tons for Concord, N. H., inquiry for cast pipe is light and buying confined to small lots. Most of the smaller communities have covered for the year. Torrington, Conn., bought 200 tons.

Pittsburgh—Activity in all forms of tubular goods is at a low level, with pipe mill operations around 10 to 15 per cent. Virtually the only sign of activity is in some sections of the east Texas oil field, where oil country goods promise to be in better demand. One producer reports a slightly better rate of operations in seamless tubing last week, although its welded output was off slightly.

Chicago—The cast pipe market is lacking in large awards and inquiries, activity still being made up principally of lots of less than 100 tons. A few small projects are pending in Wisconsin, and an award of 1024 tons for Chicago is expected shortly. It is understood that steel pipe will be used for the 1500 tons of 36-inch material pending recently for St. Louis. Utilities are not buying and the outlook for improved business from municipalities remains poor.

Cast Pipe Placed

1800 tons, Oklahoma City, Okla., 74,500 feet, 6-inch, to National Cast Iron Pipe Co., Birmingham, Ala.; 6800 feet, 8-inch, and 700 feet, 12-inch, to American Cast Iron Pipe Co., Birmingham, and 4450 feet, 2-inch, Central Foundry Co., New York.

896 tons, 4, 6 and 10-inch class 150, East Bay municipal utility district, Oakland, Calif., to United States Pipe & Foundry Co., Birmingham, Ala.

800 tons, mainly 10-inch, Croghan, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

375 tons, water works improvements, Pawnee, Okla., to United States Pipe & Foundry Co.; C. S. Clark Construction Co., Oklahoma City, Okla., general contractor.

349 tons, 24-inch class 250, Glendale, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

200 tons, 10-inch, Torrington, Conn., to Donaldson Iron Works, Emaus, Pa.

6000 feet, 14-inch, class C pipe, Fond du Lac, Wis., to Lynchburg Foundry Co., Lynchburg, Va.

Steel Pipe Placed

175 tons, including 40,000 feet steel pipe under 3-inch of which 22,000 feet is 2½-inch cement lined and 6000 feet, 3 to 8-inch, wrought pipe, drainage system, lines D and E, city-owned subway system, New York, to Grinnell Co. Inc.; Erickson Equipment Co., general contractor.

Ustated tonnage, 16-inch suction and discharge line, United States engineer, Memphis, Tenn. to Crane Co., Memphis, Tenn.

Unstated tonnage, annealed hollow-forged nickel steel seamless tubes, 2 feet, 7 inches, and 2 feet, 6¾ inches O. D., ½ and ⅜-inch walls, four cruisers, navy, to Midvale Co., $30,850 for Brooklyn and Philadelphia; $31,313, Mare Island and Puget Sound.

Cast Pipe Pending

1100 tons, 10 and 12-inch class 150, Marin municipal water district, San Rafael, Calif.; bids opened.

1000 tons, 12 and 16-inch, Concord, Mass.

370 tons, 6 and 8-inch, Glenham, N. Y.

350 tons, 6 and 8-inch, Columbus, O.

150 tons, 8- and 12-inch, Lynn., Mass.; bids in.

115 tons, 6-inch class 150, Upland, Calif.; bids June 16; alternate bids on steel pipe.

Unstated tonnage, 2400 feet of 6-inch class C pipe for Eau Claire, Wis.; bids in.

Unstated tonnage, 9500 feet of miscellaneous sizes for Sheboygan, Wis., waterworks.

Steel Pipe Pending

100 tons, turnstile equipment, railings, and gates city-owned subway, sections A, B, C, D and E, New York, Perey Turnstile Co., New York, low, $89,080. Contract includes 260 automatic turnstiles.

Unstated tonnage, approximately 325,370 feet, small size standard pipe, black, galvanized and extra strong black, navy, eastern yards delivered, Wheatland Tube Co., Philadelphia, low, $18,316.66; western yards delivered, $11,933.72; f.o.b. for western yards, $10,173.20. Bids May 31.

Taylor Back from Europe

New York—Myron C. Taylor, chairman, United States Steel Corp., is returning from Europe June 13.

Paranite Wire & Cable Corp. has been formed and has taken over the property of the India Rubber & Insulated Wire Co., Jonesboro, Ind., which has been in receivership.

Strip

New Price Plan Meets General Approval but Quiet Market Not Occasion for Real Test

STRIP PRICES, PAGE 43

Pittsburgh—Cold-rolled strip has been extended into third quarter at 2.00c, Pittsburgh, but a unified price policy by hot-rolled interests as yet lacking. The trade has not been informed of the new hot-rolled base price nor is there enough volume of inquiry for third quarter so that business be solicited. It is understood 1.50c for hot-rolled will be named, with concessions to carlot users.

New York — Little business is coming out to test the new 1.45c, Pittsburgh, single price on hot strip. Cold strip is 2.00c, Pittsburgh.

Philadelphia — Most hot strip sellers have adopted the single price of 1.45c, Pittsburgh, on widths up to and including 23 15/16 inches, with $1 premium for less-than-carlots. Cold-rolled strip is unchanged at 2.00c, Pittsburgh. No improvement is noted in demand.

Youngstown, O. — Volume of incoming specifications for strip steel is beginning to diminish. The letdown is more apparent on the part of auto partsmakers. Miscellaneous consumers have continued their demand fairly steadily, much better than automotive interests. The new single price on both wide and narrow strip, 1.50c, Pittsburgh, announced for third quarter delivery, is well received.

Cleveland—Some makers of hot-rolled strip now are applying the single price of 1.50c on both wide and narrow widths of hot-rolled strip to the general trade. The new card of extras shows a few advances and no reductions. Cold-rolled strip continues 2.20c, base, Cleveland. The brightest spot in the market, sellers say, is the firmness of prices.

Chicago—Strip mills are following the lead of eastern producers in announcing a single price and new card of extras on third quarter strip business. A single price of 1.60c, Chicago, has been established for that period. Specifications recently have improved slightly as a result of better automotive demand and operations are higher at 20 per cent. Cold-rolled strip is unchanged at 2.00c, Pittsburgh and Cleveland.

Steel Rate Down to 17 and Further Decline Indicated

Pittsburgh — Last week's ingot production showed a further decline of about three points to 17 per cent. For this week indications point to a slightly easier tone at 16 to 17 per cent. Steel operations of a leading mill here are at 12 per cent; for another 19 to 20. Smaller producers, with one exception, are operating at levels less than aforementioned. Four stacks out of 38 are active for United States Steel Corp.; three of 12 for Jones & Laughlin Steel Corp.; one of two for Pittsburgh Crucible Steel Co.

Operations week ended June 11	**17**
Operations, week ended June 4	**21**
Operations, week ended May 28	**23**
Operations week ended May 21	**25.5**
High for 1932, Feb. 6	**28.5**
Low for 1932—June 11	**17**

Philadelphia — Eastern steelmaking operations are unchanged at about 12-13 per cent, with prospects for little variation over the current week.

Buffalo—For several days prior to June 10 operations in steelworks were only 8 per cent, with three open hearths out of 37 in production. Republic began charging some of its units on that date with the result that by June 13 production was up to 16 per cent, with six furnaces in operation. Last week's rate was the lowest of all time.

Cleveland—Steel ingot production dropped to 29 per cent for the week ending June 11, from 38 per cent in the week preceding. American Steel & Wire Co. continued with five open hearths active; Corrigan, McKinney Steel Co. reduced its active units from four to three; Otis Steel Co. reduced from four to two. The rate for this week probably will be lower than 29 per cent, due to some uncertainty in the Otis schedule. Finishing mill operations are irregular, but in general are slower.

Chicago — Ingot production declined to around 18 per cent during the past week. The outlook points to no early improvement, with prospects for additional recession at some plants during the present week. The rate had held around 20 per cent for several weeks and currently is at the lowest level of the year. Eight of the 36 steel works stacks continue active.

Birmingham, Ala.—Steelmakers, holding their operations at 23 per cent, feel better about the summer. Gulf States Steel Co. has two open hearths on at Gadsden and Tennessee Coal, Iron & Railroad Co. four or five at Fairfield.

Warehouse Activity Shows Slight Change from May

Warehouse Prices, Page 58

Philadelphia—Following adoption of new schedules last week on cold finished steel, warehouse prices here are unchanged. Little variance is noted in demand.

Pittsburgh—Sales of steel products from warehouses have improved in June over the same period of May. Prices are unchanged although new extras may be expected on bands and hoops, following the recent mill change.

Cleveland—Conditions now appear a little slower. The month started quietly, at the rate noted in the last half of May. The new price set-up in cold-finished bars is working out satisfactorily, and other prices generally have been extended for third quarter.

Detroit—June thus far shows little change in the warehouse situation from the level of April and May. Prices are steady.

Cincinnati—Jobbers' sales are fairly close to May demand, following an early June tendency downward. New prices recently adopted on cold-finished bars have not influenced volume. Quotations are unchanged.

Chicago—Sales are in unchanged volume, holding near the year's lowest level, with no early improvement in prospect. Prices are expected to continue into third quarter at recent levels.

St. Louis—A fair volume of business, general conditions and the season considered, is reported by iron and steel warehouses. There has been some improvement in the movement of hoops, bands and fastenings generally.

Record River Tow Starts

Pittsburgh—Reported to be the largest steel tow of the season on the Ohio river, the steamer SAM CRAIG of the Union Barge Line recently left Pittsburgh carrying products from ten Pittsburgh manufacturers.

Raw Material Prices

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$16.00
Pittsburgh, dist. fur.	15.50
Pittsburgh, delivered	16.13 to 16.63
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.50
Philadelphia, delivered	14.26 to 14.76
Virginia furnace	17.50
Granite City, Ill., fur.	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90 to 19.40
Buff., all-rail, Newark	17.28 to 17.78
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. L.	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock del.	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	16.50
Buff., all-rail, Brooklyn	19.40 to 19.90
Buffalo, all-rail, Newark	17.78 to 18.28
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	18.00
Eastern, del. Phila.	14.76 to 15.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	17.50
Eastern, del. Phila	15.26 to 15.76

MALLEABLE

Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.50
Pittsburgh dis. fur.	15.50
Pittsburgh, delivered	16.13 to 16.63
Chicago, furnace	16.00
Buffalo fur., local del.	16.50
Eastern Penna., delivered	16.13 to 19.41
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	14.50 to 15.00
Pittsburgh, delivered	15.13 to 16.13
Eastern Penn., del.	14.50 to 15.00
Buffalo fur., local del.	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00 to 14.50

BESSEMER

Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.50
Pittsburgh, delivered	16.13 to 16.63

LOW PHOS.

Valley fur., standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	14.00
Pittsburgh district fur.	15.00
Pittsburgh, delivered	15.63 to 16.13

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19.50; 15—$23 to $24.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.00 to 2.25
Connellsville foundry	3.00 to 4.25
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.21 to 8.81
Chicago, ovens	7.00
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.50
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens Connell., basis	5.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50 to 9.00
North African low phos.	7.50 to 8.50
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot, short ton unit, duty paid	$10.25 to 10.50
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	24 cents
South African, 52%	22 to 23 cents
South African, 49-51%	21 to 22 cents
South African, 44-47%	20 to 21 cents
Indian, 48-50% (nom.)	22 cents
Brazilian, 46-48% (nom.)	18 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	35.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet, Ill., East Chicago, Ind.	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$61.50

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	32.75
Chicago	28.00
Forging, Chicago	34.00 to 35.00
Forging, Pittsburgh	33.00
Forging, Philadelphia	38.75 to 39.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00

SLABS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	36.00 to 38.00

SKELP

All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

•Ferromanganese, 78-82%, tidewater, duty paid	$68.00
•Ferromanganese, del. Pittsburgh	73.24
Spiegeleisen, 19-20%, domestic fur. spot†	27.00
Ferrosilicon, 50 per cent, freight all., c. l.	77.50
Do, less carload	85.00
Do, 75 per cent	126.00 to 136.00
Silicomang., 2½% carb.	105.00
2% carbon	110.00
1% carbon	115.00
(Spot prices, $5 a ton higher.)	
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Do, for spot delivery	10.50
Ferrotungsten, stand., lb. cont.	1.00 to 1.10
Ferrovanadium, 30-40 per cent, per lb. contained, on analysis	3.05 to 3.30
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	68.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $4.25 unitage	91.00
Ferromolybdenum, stand. 50-60 per cent. per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	.80

†Carloads. Differentials apply to quant
•To users of carloads to 1000 tons annually. Differentials to large users.

Fluorspar

85 and 5 per cent grade

Washed gravel, domes., net ton, del. Pitts. equiv.	$20.31
Washed gravel, import duty paid tide, gross ton	19.50

Pig Iron

Average Size of Orders Smaller — Shipments in Lakes Area Steady—Prices Are Untested

PIG IRON PRICES, PAGE 50

Pittsburgh—Sales of pig iron are becoming less frequent. Prices of $15.50 for foundry, malleable and bessemer are largely nominal. Little test is promised for the present basic price of $14.50 to $15. It is reported a valley steel producer has entered into an agreement with a Cleveland steel mill for its basic iron requirements in return for coal.

Boston—Pig iron continues dull. The New England producer is doing $16, or more, furnace. Consumers buying strictly on a price basis would eliminate outside iron due to low priced foreign stocks. One of the larger machine shop foundries at Providence, R. I., is closing for several weeks.

Philadelphia—Pig iron sellers say they have never seen interest in the market at such low ebb. Prices are unchanged, and tested only by scattered carlots.

Youngstown, O.—Small sales continue to characterize the pig iron market here. Malleable and foundry grades are the most active. Quotations are unchanged.

Cleveland—Some recent inquiries for 500-ton lots of pig iron have been closed for smaller amounts. Comparatively few sales reach 200 tons. A melter in the western section of this district who inquired for 1000 tons has not closed. Nevertheless, a merchant lake furnace interest reports sales so far this month double the comparable period of May and shipments continuing at the improved May rate. Its May sales were 30 per cent larger than April. The market in Cleveland continues dull, with insufficient business to test the nominal price of $15.50, base, furnace, for local delivery. It now seems fairly definitely established that this year there will not be the heavy boat shipments of iron from Cleveland to Chicago that featured the market last year.

Cincinnati—Several consumers are in the market for carload lots. A recent order for 150 tons of northern iron was received from an Indiana melter. Quotations are unchanged.

St. Louis—Seasonal conditions accentuate unusual quietness in the pig iron market, hot weather having further reduced activity at foundries. Current pig iron sales are limited to a few scattered carlots for prompt shipment. Stocks at blast furnaces continue to increase. Two or three stove manufacturing plants are operating nearly full, having been benefitted by recent orders from mail-order houses.

Chicago—Pig iron shipments are fairly steady, while new business is slow and unimproved. Orders generally are confined to lots of less than 200 tons. Only a small amount of southern iron is moving. Prices are nominal.

Toronto, Ont.—Melters are entering the market at regular intervals and a steady flow of single car orders is reported. Sales for the week were between 500 and 600 tons. Since the Dominion Steel & Coal Co., Sydney, N. S., blew in a blast furnace recently three stacks in Canada now are active.

New York—Pig iron sales comprise only small lots. Buffalo iron is unchanged at $14 to $14.50, base, furnace, and eastern Pennsylvania iron holds at $13.50 to $14, furnace.

Ferromanganese Cut May Extend to Spiegeleisen

Ferroalloy Prices, Page 50

New York—Domestic spiegeleisen may reflect shortly the recent reduction in ferromanganese to the flat price of $68, duty paid, on carlots, with no differential for larger quantities. Currently, domestic spiegeleisen, 19 to 21 per cent, is $27, furnace. Specifications for ferromanganese and spiegeleisen are slow. Importations of foreign ferromanganese although light, assume more than ordinary importance.

Pittsburgh—Ferromanganese, 72 to 78 per cent content, has been reduced $7 a ton to $68, tidewater, duty paid, thus making the Pittsburgh delivered price $73.24. This is understood to be a single price to govern all quantities. Other ferroalloy prices are unchanged. A nearby producer of molybdenum products reports improved activity.

Chicago—Shipments of ferroalloys have been fairly steady so far this month,, although declining ingot operations point to some reduction in the movement shortly. Demand for special ferroalloys holds around the rate of activity in ferromanganese and spiegeleisen. Ferromanganese now is $68, seaboard, with spiegeleisen continuing $27, furnace.

Machinery

Improvement Lacking in Weak Market—Inquiry Slow

New York—No improvement is reflected in buying or inquiry for machine tools and equipment, although a fair number of tools are required by government departments, bids going in this week and next. The government also has closed on part of the list on which bids were opened several weeks ago. Figures are also in on six tools for the state shop at Walkill, but no action has been taken on the contracts. Panama Canal closes June 17 on a list of tools.

Worcester—Inquiry for machine tools and shop equipment continues to drag. While foreign business recently placed with New England shops has not been heavy, those taking this work have better operating schedules. What volume is being done is largely on special tools with little business on standard equipment. Bids close June 21 on a geared head screw cutting lathe for Portsmouth navy yard.

Pittsburgh—Although machinery equipment buying the past week continued in its dull tone generally, there were a few signs of spotty activity. One dealer reports closing on two lathes. Pittsburgh federal engineers are seeking bids for the sale of surplus government property, bids to be opened June 23.

Although the immediate outlook continues to be far from encouraging for machine tool business pending lists still are increasing.

Cleveland—Slight activity is apparent in a desultory market for machinery and equipment, most dealers looking forward to another dull summer. A manufacturer of welding equipment reports sales trending upward and the outlook somewhat encouraging. Buying generally is widely scattered among a list of small shops.

Chicago—Activity in machine tools and plant equipment lacks improvement. Occasional orders are being placed but no definite upturn as yet is in sight. Inquiry is slow and usually consists of individual items. Chicago, Milwaukee, St. Paul & Pacific railroad is in the market for a few small tools, including a punch and shear. Railroads generally are showing little interest in new equipment, however, recent purchases having been practically nil.

Scrap

Downward Price Movement Meets No Checks as Melters Remain Out of Market

Chicago — The scrap market remains in the doldrums, prices being weak and buying entirely of small scattered lots. Shipments against some old orders of heavy melting steel are being held up, and in the absence of new buying for several weeks the market on this grade is nominal at $6 to $6.25. Quotations on most other grades also are nominal and lack a test of actual sales. The market on cast borings is sharply lower at $2.50 to $3. There is no demand in this district and on purchases for eastern shipment dealers have reduced buying prices. Cast grades are quiet as a result of the lack of improvement in foundry operations, and low phosphorus material also is moving slowly.

Boston — Scrap business is dull, lit-

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	6.50 to 7.00
Boston, dealers	3.35 to 3.75
Buffalo, No. 1	7.00 to 7.25
Buffalo, No. 2	5.50
Chicago	6.00 to 6.25
Cleve., No. 1	6.50 to 7.00
Cleve., No. 2	6.25 to 6.75
Det., No. 1 deal.	4.75 to 5.25
Det., No. 2 deal.	2.75 to 3.25
E. Pa. del. mill	6.00 to 6.50
E. Pa. No. 2, del.	4.50
N. Y. deal, R. R.	4.00 to 4.50
N. Y. deal, No. 2	2.00 to 2.50
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	8.75 to 9.25
St. L. No. 1 sel.	6.00 to 6.50
Federal, Ill.	5.75 to 6.25
Granite City, Ill.	5.00 to 5.50
Valleys, No. 1	9.25 to 9.75

COMPRESSED SHEETS

Buffalo, dealers	5.50
Chi. (Factory)	4.75 to 5.25
Cleveland	6.50 to 7.00
Detroit, dealers	4.75 to 5.25
E. Pa. new mat.	5.00 to 5.50
Pittsburgh	8.50 to 9.00
Valleys	8.75 to 9.25

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cinci., deal.	4.50 to 5.00
Cleveland	6.00 to 6.50
Eastern, Pa.	5.00
Pittsburgh	7.50 to 8.00
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	3.00 to 3.50
Cincinnati	2.50 to 3.00
Detroit, dealers	2.00 to 2.50
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	11.00 to 11.25
Boston, dealers	4.00 to 4.50
Buffalo	9.00 to 9.50
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.00 to 8.50
Cinci., deal.	8.50 to 9.50
Detroit, deal.	7.50 to 8.50
Pitts. (open-hearth, 3 ft. and less)	10.50 to 11.00
St. Louis	7.50 to 8.00

STOVE PLATE

Birmingham	6.00 to 6.50
Boston, dealers	2.00 to 2.50
Buffalo	7.00 to 7.25
Chicago, net	5.00 to 5.50
Cinci., deal. net	3.25 to 3.75
Det., net deal.	2.50 to 3.00
Eastern Pa.	6.00
N. Y., deal. mill	2.50 to 3.00
St. Louis	5.50 to 6.00

COUPLERS, SPRINGS

Buffalo	9.50 to 10.00
Chicago	7.00 to 7.50
Eastern Pa.	7.50 to 8.00
Pittsburgh	9.75 to 10.25
St. Louis	7.00 to 7.50

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	7.00 to 7.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	9.00 to 9.50
Cleveland bil. and bloom crops	9.00 to 10.00
Eastern Pa.	9.00 to 10.00
Pittsburgh billet bloom crops	13.00 to 13.50
Pitts., sheet bar crops	11.50 to 12.00

FROGS, SWITCHES

Chicago	6.00 to 6.25
St. Louis	6.00 to 6.50

SHOVELING STEEL

Chicago	6.00 to 6.25
Cleveland	6.25 to 6.50
St. Louis	6.00 to 6.50

RAILROAD WROUGHT

Birmingham	6.00 to 6.50
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	4.75 to 5.25
Buffalo, No. 2	7.00 to 7.25
Cinci., No. 2	4.50 to 5.00
Chicago, No. 1	5.00 to 5.60
Chicago, No. 2	6.00 to 6.25
Eastern, Pa.	7.50 to 8.00
N. Y., No. 1, deal.	2.50 to 3.00
Pitts., No. 2	8.75 to 9.25
St. Louis, No. 1	4.50 to 5.00
St. Louis, No. 2	6.00 to 6.50

SPECIFICATION PIPE

Boston	4.00 to 4.25
Eastern Pa.	8.00 to 8.50
N. Y., deal.	2.50 to 3.00

BUSHELING

Buffalo, No. 1	5.50
Chicago, No. 1	4.50 to 5.00
Cinn., No. 1 dl.	3.75 to 4.25
Cinn., No. 2	2.25 to 2.75
Cleve., No. 2	4.00 to 4.25
Det., No. 1 new deal.	3.25 to 3.75
St. L., No. 1	3.50 to 4.00
Val. new No. 1	8.25 to 8.75

MACHINE TURNINGS

Birmingham	3.25 to 3.50
Boston, dealers	0.50 to 1.00
Buffalo	4.25 to 4.50
Chicago	2.25 to 2.75
Cin., deal.	2.75 to 3.25
Cleveland	3.00 to 3.50
Detroit	1.75 to 2.25
Eastern, Pa.	3.50 to 4.00
N. Y., deal	1.35 to 1.50
Pittsburgh	5.00 to 5.50
St. Louis	1.50 to 2.00
Valleys	6.50 to 7.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	.60 to .75
Buffalo	4.75 to 5.25
Cinn., deal.	2.75 to 3.25
Cleveland	3.50 to 4.00
Detroit, deal	2.25 to 2.75
Eastern Pa.	3.00 to 3.50
N. Y., deal	1.35 to 1.50
Pittsburgh	5.50 to 6.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	3.25 to 3.50
Boston, chem.	5.00 to 5.50
Boston, dealers	1.00 to 1.25
Buffalo	4.75 to 5.25
Chicago	2.50 to 3.00
Cinn., deal.	2.75 to 3.25
Cleveland	3.50 to 4.00
Detroit, deal.	2.25 to 2.75
Eastern Pa.	3.00 to 3.50
E. Pa., chem.	8.00 to 10.50
N. Y., deal.	1.50 to 2.00
Pittsburgh	5.50 to 6.00
St. Louis	3.25 to 3.75

PIPE AND FLUES

Cinn., deal.	3.00 to 3.50

RAILROAD GRATE BARS

Buffalo	4.75 to 5.25
Chicago, net	4.75 to 5.25
Cincinnati	4.25 to 4.75
Eastern Pa.	6.00
N. Y., deal.	3.50 to 4.00
St. Louis	4.50 to 5.00

FORGE FLASHINGS

Boston, dealers	2.50 to 3.00
Buffalo	4.50 to 5.00
Cleve. ov. 10 in.	6.50 to 7.00
Detroit	3.50 to 4.00

FORGE SCRAP

Boston, dealers	2.00 to 2.25
Chicago	7.50 to 8.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to 5.50
St. Louis	6.00 to 6.50

AXLE TURNINGS

Boston, deal.	6.00 to 6.50
Buffalo	6.50 to 7.00
Chi., elec. fce.	5.00 to 5.50
Cleveland	6.50 to 6.75
Eastern Pa., del.	6.00
Pittsburgh, O. H.	7.50 to 8.00
St. Louis	5.00 to 5.50

STEEL CAR AXLES

Birmingham	10.50 to 11.00
Boston, ship. pt.	8.25 to 8.75
Buffalo	10.00 to 10.50
Chicago	9.50 to 10.10
Eastern Pa.	14.50 to 15.00
St. Louis	9.00 to 9.50

SHAFTING

Boston, ship. pt.	8.50 to 9.00
N. Y., deal.	6.50 to 7.00
St. Louis	7.50 to 8.00
E. Penna.	13.00 to 14.00

CAR WHEELS

Birming., iron	7.50 to 8.00
Boston, iron deal.	4.00 to 4.50
Buffalo, iron	8.00 to 8.50
Buffalo, steel	8.50 to 9.00
Chicago, iron	6.25 to 6.75
Chi., rolled steel	6.75 to 7.25
Cincinnati iron	6.75 to 7.25
E. Pa. steel	7.50 to 8.00
E. Pa. iron	9.00 to 9.50
Pitts. iron	9.50 to 10.00
Pitts., steel	9.75 to 10.25
St. Louis, iron	5.50 to 6.00
St. Louis, steel	6.50 to 7.00

NO. 1 CAST SCRAP

Birmingham	7.00 to 7.50
Buffalo (Mach.)	9.00 to 9.50
Buffalo, cupola	8.00 to 8.50
Boston, textile	7.50 to 8.00
Chicago, mach.	6.70 to 7.25
Chi., railroad	5.90 to 6.45
Chicago, agri.	5.60 to 6.15
Cinn., mach. cup.	7.50 to 8.00
Cleve. cupola	6.50 to 7.00
Det., net deal.	6.75 to 7.25
E. Pa. cupola	9.00
N. Y. cup. deal.	6.00 to 6.50
N. Y., del. local foundries	7.50 to 8.00
Pitts., cupola	9.00 to 9.50
San Fran., del.	13.50 to 14.00
Seattle	5.00 to 7.50
St. L. No. 1 ma.	6.50 to 7.00
St. L., No. 1	6.00 to 6.50

HEAVY CAST

Boston, del.	3.00 to 3.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break	5.50 to 6.00
Cleve., break	3.50 to 4.00
Detroit, auto, net deal.	8.00 to 8.50
Det., break., dl.	4.00 to 4.50
Eastern Pa.	8.00 to 8.50
N. Y. No. 1, dl.	4.00 to 4.25
N. Y. break, dl.	4.00 to 4.50
Pittsburgh	7.75 to 8.25

MALLEABLE

Boston Consum.	6.00 to 6.25
Buffalo	8.00 to 8.50
Chicago, agri.	5.50 to 6.00
Chicago, R. R.	6.50 to 7.00
Cinci., R. R., del.	7.50 to 8.00
Cinci., agri. del.	7.00 to 7.50
Cleveland, rail	7.50 to 8.00
Det. auto deal.	5.00 to 6.00
St. Louis, rail	5.50 to 6.00

RAILS FOR ROLLING
5 feet and over

Birmingham	8.50 to 9.00
Boston, deal.	5.50 to 6.00
Buffalo	7.00 to 7.50
Chicago	8.00 to 8.25
Eastern Pa.	9.50
New York dealer	4.25 to 4.75
St. Louis	8.00 to 8.50

LOCOMOTIVE TIRES

Chicago, cut	7.50 to 8.00
St. L., No. 1	6.00 to 6.50

LOW PHOS. PUNCHINGS

Chicago	7.50 to 8.00
Buffalo	9.00 to 9.50
Eastern Pa.	9.50 to 10.00
Pittsburgh	10.50 to 11.00

Scrap + Baling = $$$

WE BUILD

BALING PRESSES

HYDRAULIC PRESSURE PUMPS

HYDRAULIC STRAIGHTENERS

SPECIAL HYDRAULIC PRESSES

ACCUMULATORS

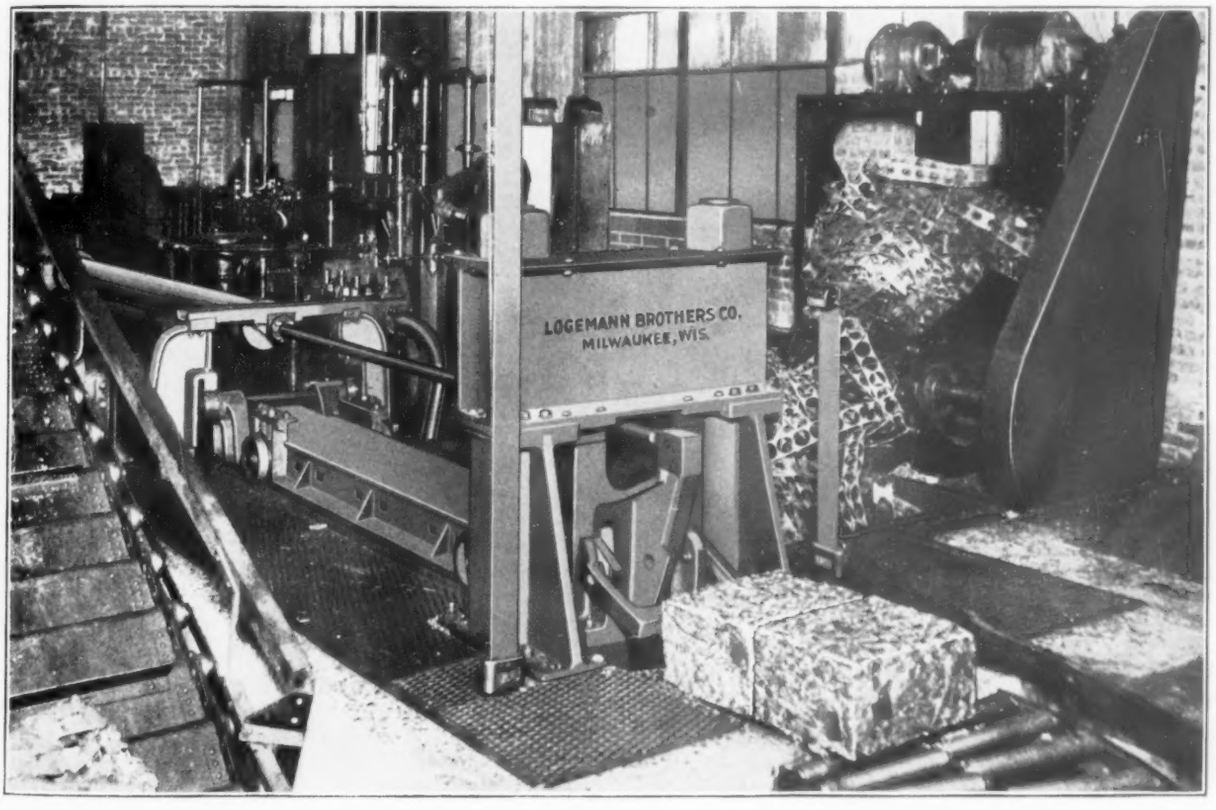
Write Us Your Problems

Hydraulically-compressed scrap commands at all times the best price - - can be more economically handled - - can be readily held for favorable markets.

Baling practically eliminates corrosion - - saves much heat in remelting - - permits easy loading of scrap cars to capacity.

The installation below is in a plant making automotive electrical equipment. Scrap comes to the baling room over the horizontal conveyor at the right, is caught by the hopper, while press is finishing a bundle, then automatically charged into press. Press cover shoves the finished bundles to the rollers carrying them to the inclined apron - conveyor at the left, this discharges directly into gondola - car outside.

Our Engineering Department, with years of experience on installations of all kinds, is at the service of interested scrap - producers. Write us.



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tle actual business developing. Prices are weak on most grades, although $4.50c is being paid for some No. 1 steel, f.a.s., for export to Japan. This grade is unchanged for delivery to Worcester at $5. No. 1 wrought is inactive, the New England consumer being out of the market. Short rails, railroad malleable and cast iron car wheels are lower.

New York—Heavy melting steel for barge loading is off 50 cents to $4, a recent buyer for Japan against an old order having dropped the price. Buying for this export order has stopped, and, while some No. 1 steel for barge is being bought at Brooklyn at $4 this week, activity at Jersey has practically halted. Volume in all grades is light and prices are inclined to weakness, cast iron car wheels, breakable cast and steel yard scrap for eastern consumption being off 50 cents. Wrought, city long, has brought brokers' bids as low as $2 and skeleton $1.75.

Philadelphia — No. 2 heavy melting steel has been reduced 50 cents to $4.50, delivered, and No. 1 railroad wrought nominally $1 to $6.50 to $7, delivered. Trading is slack.

Buffalo — Steelworks which have been accepting shipments of No. 2 heavy melting steel have directed dealers to make no more deliveries until further notice. No new buying of this material is in sight.

Pittsburgh—No further mill purchases were reported last week, with dealers still bearish. Sale of heavy melting steel in the Pennsylvania railroad list at around $9 further substantiates the present spread of $8.75 to $9.25 on that grade. An expected mill purchase of heavy melting steel set for June 7 did not materialize. Continuing the downward drift bundled sheets, compressed sheets, machine shop turnings and blast furnace material all display an easier trend.

Cleveland—Except for an occasional sale of a carload of steel and iron scrap, the market here and at Youngstown is at a standstill, with prices nominally lower, in keeping with competitive centers.

Detroit—Further reductions in practically all grades of iron and steel scrap carry the market down to the level of $4.75 to $5.25 for heavy melting steel and compressed sheets. The price situation generally is soft, less scrap is moving out, the boat movement away from the district is light, the local steelworks is reducing its inventory. There is practically no market for automobile malleable.

Cincinnati — Prices on iron and steel scrap have undergone another revision downward. Heavy melting steel weakened to a dealer quotation of $4.50 to $5. New consumer buying is negligible.

St. Louis—The iron and steel scrap market remains unchanged. Total tonnage changing hands is small, and the trend of prices continues downward. The only recent incident was the purchase of 2000 tons of heavy melting steel by an east side interest for delivery through the next few weeks. It is understood that the price was $5 per ton, the lowest recorded for more than two decades.

Toronto, Ont.—General trading listlessness holds throughout the iron and steel scrap markets. Steel grades are inactive, with no shipments to mills in the Hamilton district. Montreal dealers are closing odd lots but no large tonnages. Iron grades are holding at a fair level with machinery cast most favored.

Canadian Scrap

Dealers' Buying Prices

Per Gross Ton

MONTREAL

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Iron Ore Price Adoption Is Now General

Iron Ore Prices, Page 50

Cleveland—Few and inconsequential open-market sales of iron ore have been made since the price confirmation at last year's levels was announced in STEEL last week. However, the prices have been adopted as the basis for all continuing contract arrangements. Receipts at Lake Erie ports in May totaled 65,137 tons, compared with 769,436 tons in the month last year. Receipts at other lake ports, chiefly the Chicago district, were 79,270 tons, compared with 656,135 tons in May, 1931. The movement continues slow, but an acceleration soon is indicated by the fact that some United States Steel Corp. boats are being fitted out.

Coke

Sales and Shipments of Foundry And Furnace Grades Continue Restricted to Carload Lots

COKE PRICES, PAGE 50

Pittsburgh—Foundry coke business is composed of occasional carload shipments, and furnace coke is in even less active demand. Foundry specifications represent rush orders. Prices of $3 to $4.25, depending upon grade, for foundry coke are unchanged, as is furnace coke at $2 to $2.25.

New York—Prices of beehive furnace coke are unsettled, with the heating grades holding at $1.50 to $2, Connellsville, and the smelting grades at $2 to $2.25. Beehive foundry coke continues $3 to $4.25, ovens, depending upon grades. By-product foundry coke is $8.21 to $8.81, delivered, Newark, N. J.; $10, New England; and $8.50, Philadelphia.

Cincinnati—Shipments of by-product foundry coke are holding to the May rate. Several carloads to an important consumer who has been out of the market several months, with other similar examples have caused a better sentiment in the market. Prices are unchanged.

Chicago — By-product foundry coke shipments are unchanged and at a low rate. Consumption has been fairly steady for the past several weeks. The market continues $7, ovens.

St. Louis—Demand for metallurgical coke continues quiet. Shipments consist of a few carloads for immediate use. In accordance with action in other midwestern centers the price of by-product foundry coke has been reduced 50 cents to $7.75, delivered in the St. Louis switching area.

Birmingham, Ala.—Coke production has been further reduced, only about one-third of the by-product ovens in this district now being in operation. A small amount of coke is being shipped outside this district.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 5.75c, Conn., for copper

Sheets	
Yellow brass (high)	12.00
Copper, hot rolled	15.12½
Lead sheets, cut, to jobbers	6.50
Zinc sheet (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	15.25
Seamless copper	14.37½
Rods	
Yellow brass (high, full turnings)	9.75
Naval brass	10.87½
Anodes	
Copper untrimmed	11.75
Wire	
Yellow brass (high)	12.00

Old Metals

Dealers' buying prices, cents lb. No. 1 Composition Red Brass

New York	2.75 to 2.87½
Chicago	1.87½ to 2.00
Cleveland	2.25 to 2.50
St. Louis	2.25
Heavy Yellow Brass	
New York	1.75 to 1.87½
Heavy Copper and Wire	
New York	3.62½ to 3.87½
Chicago	2.50 to 2.62½
Cleveland	2.25 to 2.75
St. Louis	2.75
Composition Brass Borings	
New York	2.25 to 2.50
Yellow Brass Tubing	
Cleveland	1.25 to 1.50
Light Copper	
New York	2.75 to 3.00
Chicago	2.00 to 2.25
Cleveland	2.00 to 2.25
St. Louis	2.25
Light Brass	
Chicago	1.12½ to 1.25
Cleveland	1.00 to 1.25
St. Louis	1.25
Lead	
St. Louis	2.00
Zinc	
New York	0.75 to 1.00
Cleveland	0.87½ to 1.00
St. Louis	1.00
Aluminum	
Clippings, new, soft, Cleve.	9.00 to 9.50
Clippings, hard, Cleveland	6.50 to 7.00
Borings, Cleveland	2.50 to 3.00
Mixed cast, Cleveland	3.00 to 3.50
Mixed cast, St. Louis	2.50 to 3.00

Secondary Metals

Remelt, aluminum No. 12	7.00 to 8.00
Brass ingots, 85-5-5-5	6.00

Metals

Expect Rise in Copper Prices As Result of 4-Cent Duty—Tin Drops—Lead Prices Steady

New York—Tone of the copper market improved last week as the result of the passage of the 4-cent tariff. Failure of a large metal firm in London brought a slump in tin prices. Lead remained steady, as did antimony, aluminum and nickel, but zinc eased somewhat.

Copper—Prices firmed up on the passage of the tariff Monday as part of the tax bill. Trade interests expressed the opinion that the metal would go to 6.00c, Connecticut, by June 21 when the measure becomes law. Last week sufficient copper was available to supply demand at 5.37½c although some interests were inclined to ask ⅛-cent higher. Sales for the period were the heaviest in two months although no general buying movement was apparent.

Lead—Demand was moderately active with purchases well diversified. Business was principally for June and July shipment. Principal buyers were corroders and battery manufacturers. Quotations continued steady on the basis of 2.90c, East St. Louis, and 3.00c, New York.

Zinc—Shading developed in the market the latter part of the week and 2.80c, East St. Louis, became more general. Sales were light. The trade was encouraged by the sharp cut in production last month although stocks showed a further rise.

Tin—Failure of the 80-year old London metal firm of Lewis Lazarus & Sons resulted in a drop in Straits tin to below 19.00c. About 5500 tons of tin held by the company were taken up by a quickly formed pool but it was thought that some of its members would find it necessary to liquidate their holdings. The domestic market firmed up somewhat Friday. Consumers showed little buying interest.

Antimony—Quotations remained steady during the week but demand was dull.

Aluminum—Buying continued in light volume. No. 12 remelt was easier but virgin metal was steady.

Coke By-Products Prices And Shipments Steady

New York—Demand for toluol holds well at a period when some recession is the rule, this being largely due to increases in automobile production, requiring finishes. Benzol, xylol and solvent naphtha are in fair demand. Naphthalene shipments are steady. Prices are firmer, with discussion of a possible advance in the fall. Phenol demand is light. Sulphate of ammonia is easy.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.26
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants	
Phenol	0.153 to 0.173
Per Pound at Producers' Plants in	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.00

Quicksilver Is Lower

New York—Quicksilver prices are lower, and the market dull. The metal now is quoted $63 a virgin flask of 76 pounds, for spot delivery, in small lots. Reports from California this week indicate ruling prices there are $61 to $64 a virgin flask.

Nonferrous Metal Prices of the Week, Cents a Pound

	Copper, Electro delivered	Copper, Lake delivered	Copper, Casting refinery	Straits Tin, New York, Spot	Straits Tin, New York, Futures	Lead, New York	Lead, East St. L.	Zinc, St. L.	Aluminum, 98-99%	Antimony, Spot	Nickel, Ingot
June 4	5.37½	5.87½	5.12½	20.75	21.20	3.00	2.90	2.82½	22.90	5.12½	35.00
June 6	5.37½	5.87½	5.12½	20.12½	20.60	3.00	2.90	2.82½	22.90	5.12½	35.00
June 7	5.37½	5.87½	5.12½	19.87½	20.50	3.00	2.90	2.82½	22.90	5.12½	35.00
June 8	5.37½	5.87½	5.12½	19.62½	20.20	3.00	2.90	2.82½	22.90	5.12½	35.00
June 9	5.37½	5.87½	5.12½	18.60	19.20	3.00	2.90	2.80	22.90	5.12½	35.00
June 10	5.37½	5.87½	5.12½	19.50	20.05	3.00	2.90	2.80	22.90	5.00	35.00

Crimping

Crimping is a common and relatively simple fabricating operation, yet even here there's a big difference in the results when Youngstown Sheets are used.

At the right a sheet metal worker is crimping the end of a length of furnace pipe—and he will tell you that it is an easier operation, and makes a better job, when Youngstown Sheets are used.

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YOUNGSTOWN

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Pacific Coast

Better Lettings in Shapes, Pipe And Reinforcing Bars Feature San Francisco Area—Mill and Warehouse Prices Are Advanced —Little Change in Northwest Demand

San Francisco—(*By Air Mail*)—Although demand, generally, has shown little improvement several awards have been placed. Featuring these were 1000 tons of shapes for cableways for the Six Companies, Boulder City, Nev., and 896 tons of cast iron pipe for Oakland, Calif., placed with the United States Pipe & Foundry Co. Mill and out-of-stock prices were advanced, effective June 1.

Concrete bar awards exceeded 1200 tons. The Pacific Coast Steel Corp. booked 400 tons for industrial buildings at Sunnyvale, Calif., for the dirigible base and the Truscon Steel Co. took 130 tons for a high school in Sacramento, Calif. Merchant bar steel has been advanced from 2.00c to 2.10c, c.i.f.

Structural shape awards were the second largest of any week this year and aggregated 3719 tons. The Consolidated Steel Corp., in addition to securing the above mentioned 1000 tons for cableways, booked 666 tons for gates for the Hoover Dam project, 680 tons for a power house for Vernon, Calif., and 275 tons for the St. Joseph hospital, Pasadena, Calif. Judson-Pacific Co. took 197 tons for the Hanchette apartments in San Francisco. Standard shapes and wide flange material have been advanced from 2.00c and 2.10c, c.i.f. respectively to 2.10c and 2.20c, c.i.f. Prices on plates have been advanced from 1.90c to 2.00c, c.i.f.

American Cast Iron Pipe Co. secured 349 tons of 24-inch pipe for Glendale, Calif. Bids have been opened on 1100 tons for the Marin municipal water district, San Rafael, Calif.

Warehouse prices in the San Francisco and Los Angeles districts were advanced June 1. Respectively, merchant bars, plates and shapes, in Los Angeles and San Francisco are now quoted at 3.30c and 3.15c; No. 10 blue annealed at 3.60c and 3.50c; No. 24 black at 4.20c and 3.95c; and No. 24 galvanized at 4.50c and 4.55c. Cold-finished steel, in both cities, is firm at 4.25c, while bands in Los Angeles are quoted at 3.80c, and in San Francisco at 3.65c.

Seek To Steady Prices

Seattle—Mills and Pacific Coast jobbers have joined forces in an effort to stabilize prices in Washington, Oregon and California. This follows a recent advance of 10 cents in mill prices on plates, bars and shapes.

Effective June 6 jobbing schedules in Seattle and Portland territory were advanced 25 cents on all items except shafting and possibly reinforcing bars. While shafting is not raised, inasmuch as new quantity extras apply on this item, ranging from 0.25c to a maximum of 1.25c, this is also firmer. On some items the northern markets are lower than California but it was deemed inexpedient to apply too heavy an increase at this time. The general effect is favorable and gives Coast markets a stronger tone, although in both Seattle and Portland districts business has not improved and sales continue slow and in small tonnages.

Steel in Europe

British Steelmakers Form Board To Revamp Industry

London—(*By Cable*)—Following a conference between British steelmakers and the government's tariff advisory committee, a national committee has been formed to prepare reconstruction plans for the steel industry, with the purpose of supplying British users with material at prices to allow world competition.

Charles Mitchell, chairman of Dorman, Long & Co. Ltd., is chairman of the new committee, and Sir William Large is secretary. If the reconstruction program is not complete within the three months covered by the 33 1/3 per cent provisional tariff on steel, this will be extended until a permanent tariff plan can be put into effect. Sir George May, government adviser, informed the committee it must work out its own plan but the tariff commission will criticize if it seems inadequate.

Present market conditions are unsatisfactory but Germany is taking some orders from America and Great Britain.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 9

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon	$10.76	2 18 6	$ 8.75 to $ 9.23	1 16 0 to 1 18 0
Basic bessemer	10.30	2 16 0*	7.41 to 7.90	1 10 6 to 1 12 6
Hematite, Phos. .03-.05	11.59	3 3 0	.....	.....
SEMIFINISHED STEEL				
Billets	$17.94	4 17 6	$9.48	1 19 0
Wire rods, No. 5 gage	27.60	7 10 0	21.87	4 10 0
FINISHED STEEL				
Standard rails	$30.36	8 5 0	$28.55	5 17 6
Merchant bars	1.00c	6 2 6	.48c to .50c	2 4 0 to 2 5 0
Structural shapes	1.21c	7 7 6	.45c to .46c	2 1 0 to 2 2 0
Plates, †¼ in. or 5 mm	1.44c	8 15 0	.59c to .61c	2 14 0 to 2 15 0
Sheets, black, 24 gage or 0.5 mm.	1.31c	8 0 0	1.20c to 1.21c	5 9 0 to 5 10 0
Sheets, gal., 24 gage, corr.	1.72c	10 10 0	1.51c	6 17 6
Bands and strips	1.31c	8 0 0	.72c to .74c	3 5 0 to 3 7 6
Plain wire, base	1.56c	9 10 0	1.18c	5 7 6
Galvanized wire, base	1.89c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.80c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 2.76	0 15 0	$3.20	0 13 2

British ferromanganese $72 to $75 delivered Atlantic seaboard, duty paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$10.76	2 18 6	$ 8.67	220(2)	$ 9.07	325	$16.39	69
Basic bessemer pig iron	10.30	2 16 0*	7.88	200(1)	7.95	285	17.84	75.50
Furnace coke	2.44	0 13 3	4.89	124	4.05	145	4.56	19.20
Billets	20.24	5 10 0	14.58	370	10.46	375	22.93	96.50
Standard rails	1.37c	8 7 6	1.41c	785	1.57c	1,210	1.37c	127
Merchant bars	1.09c	6 12 6	.95c	530	.55c	420	1.19c	110
Structural shapes	1.44c	8 15 0	.99c	550	.55c	420	1.16c	107.50
Plates, †¼-in. or 5 mm.	1.48c	9 0 0	1.17c	650	.70c	535	1.37c	127
Sheets, black	1.35c	8 5 0§	1.44c	8.0‡	.88c	675‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	1.60c	9 15 0	2.70c	1,500	1.78c	1,370	4.00c	370
Plain wire	1.39c	8 10 0	2.03c	1,130	1.95c	1,500	1.92c	178
Bands and strips	1.56c	9 10 0	1.04c	580	.88c	675	1.37c	127

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. base price.
British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	58	44½	½	25	7
¼	62	50½	¾	30	13
1—3	64	52½	1—1¼	33	17
			1½—2	37	20

LAP WELD

2	57	45½	2	25	11
2½—6	61	49½	2½—3½	30	15
7—8	58	45½	4—6	32	19
9—10	56	43½	7—8	31	18
11—12	55	42½	9—12	28	13

BUTT WELD

Extra strong, plain ends

⅛	55	44½	¼ & ⅜	+11	+46
¾	60	49½	½	25	9
1—1½	62	51½	¾	30	14
2—3	63	52½	1—2	36	20

LAP WELD

Extra strong, plain ends

2	55	44½	2	31	15
2½—4	59	48½	2½—4	36	22
4½—6	58	47½	4½—6	35	21
7—8	54	41½	7—8	33	19
9—10	47	34½	9—12	23	10
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½ 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ....$32.00 to 33.00
Four-inch, Birmingham .... 36.00 to 37.00
Four-inch, Chicago ..... 38.40 to 42.40
Six to 24-inch, Chicago..... 34.40 to 38.40
Six-inch and over, N. Y..... 26.00 to 28.00
Four-inch, New York ..... 32.50 to 34.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.00c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.65c
Los. Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	2.75c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los. Ang. cl.	1.90c
Los Ang., lcl	2.20c
New York	2.65c-3.10c
Phila.	2.26½c
Pittsburgh	2.60c
San Fran. cl.	2.60c
San Fran. lcl	2.80c
Seattle	3.00c
St Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	2.75c
San Fran.	3.75c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	2.75c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.50c
Buffalo	3.50c
Chattanooga	3.50c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.35c
Los Ang.	3.60c
N. Y.	3.00c
Portland	3.75c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.20c
Buffalo	4.10c
Chattanooga	3.65c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.75c-4.00c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.25c
San Fran.	4.05c
Seattle	4.50c
St. Louis	3.80c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	4.75c
Buffalo	4.55c
Chattanooga	3.95c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	3.75c
Detroit	4.00c
Houston	4.25c
Los. Ang.	4.35c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	4.75c
San. Fran.	4.55c
Seattle	5.00c
St. Louis	4.35c
St. Paul	4.19c
Tulsa	5.10c

BANDS

Baltimore	3.25c
Boston	3.75c
Buffalo	3.35c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	3.80c
New York(d)	3.40c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.25c
San Fran.	3.65c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

HOOPS

Baltimore	3.25c
Boston	4.90c-5.40c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.75c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	2.95c
Chattanooga*	3.65c
Chicago	2.95c
Cincinnati	3.29c
Cleveland	2.95c
Detroit	3.17c
Los Ang. (a)	4.25c
New York	3.30c
Philadelphia*	3.10c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.35c
Tulsa	4.65c

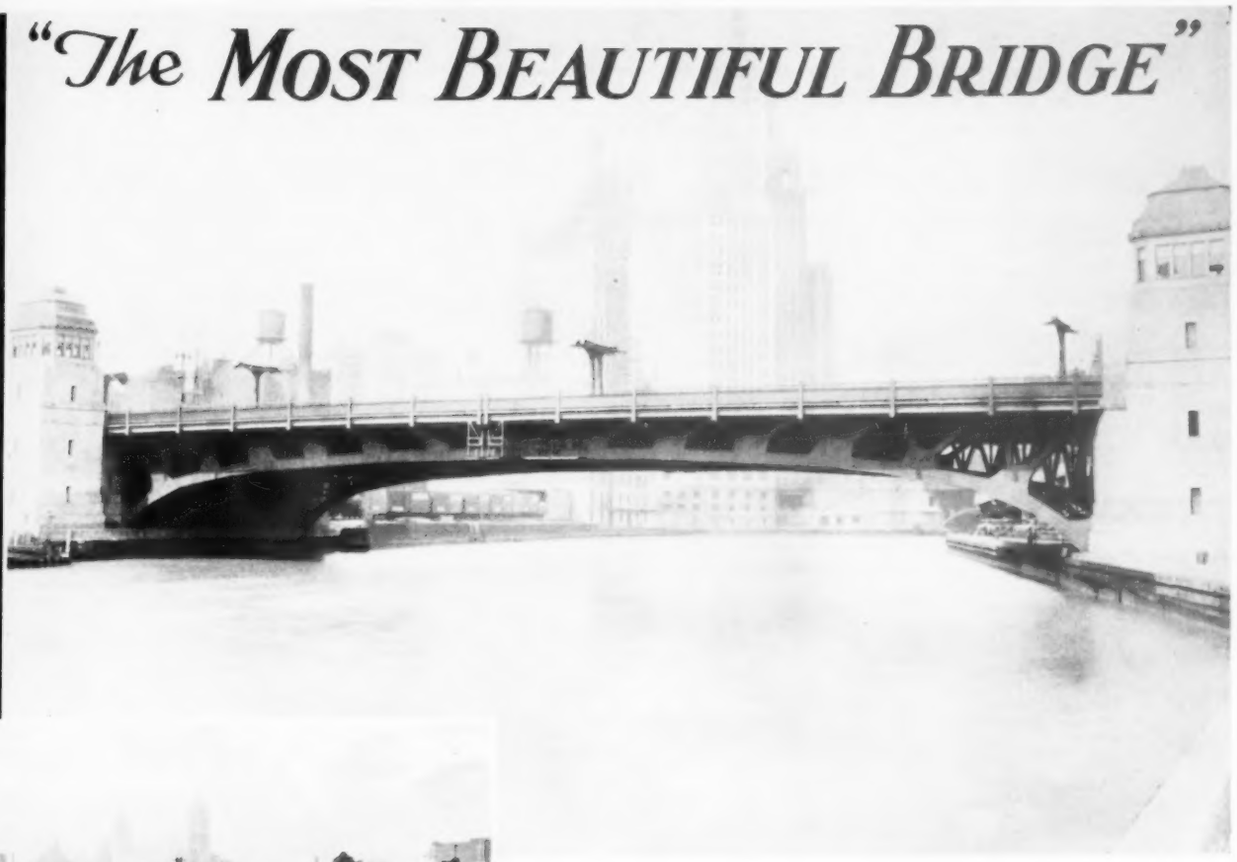
Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.25c
Chicago (soft) (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets.
*†50 or more bundles

"The Most Beautiful Bridge"



Bridge viewed from East

Bridge open

A double leaf, deck type, trunnion bascule bridge.
269 ft. between centers of trunnions.
60 ft. roadway and two 15 ft. sidewalks.
Cost $1,750,000.

Designed by the Bureau of Engineering, Department of Public Works, City of Chicago

General Contractor---
Ketler-Elliot Company, Chicago, Ill.

The North Wabash Avenue Bridge in Chicago bears the distinction of having been selected by a National Jury appointed by the American Institute of Steel Construction as "*the most beautiful steel bridge built in* 1930."

The Steel superstructure for this bridge, as well as the steel framework for many of the skyscrapers in the background, was furnished and fabricated by the American Bridge Company from structural shapes rolled by the mills of the Illinois Steel Company.

The Gary Plant of the American Bridge Company, ample in capacity and modern in equipment, offers unusual facilities for prompt and economical execution of orders covering any class of structural steel construction and is advantageously located for quick deliveries to the Chicago Metropolitan area.

US STEEL

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

Contracting Offices: Baltimore, Boston, Chicago, Cincinnati, Cleveland, Denver, Detroit, Duluth, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City.

Pacific Coast Distributors: COLUMBIA STEEL COMPANY, San Francisco, Los Angeles, Portland, Seattle.
Export Distributors: UNITED STATES STEEL PRODUCTS COMPANY, New York, N. Y.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

REVERE, MASS. — Tidewater Oil Sales Corp. has bought 42 acres on Chelsea creek and Belle Isle inlet and will build oil terminal for bulk storage of petroleum.

CHARLESTOWN, MASS.—Joseph A. Young Co., 286 Rutherford avenue, is building two additions to its warehouse for plumbing supplies, increasing floor space 8000 square feet.

SOUTH BOSTON, MASS. — Berger Metal Culvert Co., 307 Dorchester avenue, has built two 1-story buildings for dipping department of its culvert works. James T. Glover is president.

New York

LONG ISLAND CITY — Peerless Weighing Machine Co., 245 Fifth avenue, New York, has leased a plant with 16,500 feet floor space and will equip a shop for repair of weighing and vending machines at Forty-third avenue and Forty-third boulevard.

NEW YORK—Queensboro Iron Works has been incorporated with $10,000 capital, by J. Gold, Long Island City, N. Y.

ONEIDA—Dawn Mfg. Co. has been incorporated with 200 shares common stock to manufacture hardware, by E. F. Kitendaugh, Oneida.

ROCHESTER—Pneumatic Bucket & Machinery Mfg. Corp. has been incorporated with $300,000 capital to manufacture machinery, by F. A. Buckland, Rochester.

New Jersey

UNION CITY—Oil Engineering Corp. has been incorporated with 2500 shares no par value to manufacture oil burners, by Davis & Stewart, Union City.

Pennsylvania

LANCASTER—A. M. Dellinger Inc. has been incorporated with $100,000 capital to manufacture metal products, machinery, castings, tools and similar articles, by Mary M. Dellinger, 237 East Clay street, Lancaster, Pa.

PHILADELPHIA—Pioneer Engineering Co. has been incorporated with $5000 capital to manufacture and repair ship engines and parts, by Joseph R. Williams.

PHILADELPHIA—Koenig Steam & Gas Iron Mfg. Co. has been incorporated with $10,000 capital to manufacture textile machinery and gas and electric appliances, by Harry A. Koenig, 607 Olney avenue, Philadelphia.

Michigan

DETROIT—Michigan Boiler & Sheet Iron Works Inc. has been incorporated with $2500 capital to manufacture plate and sheet metal work, by Frank Wimmer, 2325 Edison avenue, Detroit.

DETROIT—Z-Roll Products Co. has been incorporated with 5000 shares no par value to manufacture vending machines, by Jack Campbell, Majestic Hotel, Detroit.

Indiana

ALEXANDRIA—City of Indianapolis plans a municipal electric light and power plant at Alexandria, to cost $40,000. J. W. Moore, Knights of Pythias building, Indianapolis, is engineer.

INDIANAPOLIS — State highway commission, J. J. Brown, director, state house annex, 102 North Senate avenue, Indianapolis, is considering bids for state highway garages, as follows: Anderson, 1 and 2 stories, 50 x 80 feet, cost $11,000; Bluffton, same; Auburn, $8000.

MARION—Superior Body Co. Inc. has been incorporated with 2500 shares no par value to manufacture dump bodies for trucks, by John A. Shue, Harry Goldthwaite and associates.

ST. MEINRAD—St. Meinrad Academy, is having plans drawn by Charles Brossman, 1010 Chamber of Commerce building, Indianapolis, for a power plant and water system.

Illinois

CHICAGO—Automatic Equipment & Engineering Co., 1725 Belleplaine avenue, has been incorporated with $5000 preferred and $10,000 common stock to manufacture mechanical devices, by Stephen Schauer, 1725 Belleplaine avenue.

PEORIA—National Wire Products Co., 232 West Sherman street, has been incorporated with $30,000 capital to manufacture wire products, by William R. Wilday, 425 Peoria Life building, Peoria.

ROCKFORD—Automatic Pumps & Softener Corp., 1907 Kishwaukee street, has been incorporated with $150,000 capital and 15,000 shares no par value to manufacture water softening equipment and pumps, by Bruce Johnson, O. W. Johnson and associates.

Southern States

NEW ORLEANS—Board of administration, Charity Hospital of Louisiana, is taking bids on a building to cost $600,000, including a power plant. Dr. Arthur Vidrine is superintendent of hospital, in charge of plans.

Missouri

ST. LOUIS—Board of public service will take bids until June 14 for new greenhouse at Forest Park, including boiler plant and heating system.

Oklahoma

DRUMRIGHT—Auto Cylinder Works has been formed by Ralph G. Oler to operate an automotive machine shop.

LAWTON—Lawton Machine Shop has been organized by R. I. Smith, owner and manager.

TULSA—Ringgold Pipe Co. has been incorporated by Murray Ringgold, 108 East Twenty-sixth street, to operate a pipe yard with shop for rethreading pipe.

WEWOKA—S & H Pipe & Supply Co. has been incorporated with $10,000 capital to operate a pipe shop and supply business, by W. Marks, president.

Dominion of Canada

GREENWOOD, B. C.—Wellington Beaverdell Syndicate plans construction of a power plant here.

ST. BONIFACE, MAN. — Winnipeg Bridge Co. Ltd., Lombard building, Winnipeg, Man., plans an addition to its plant at St. Joseph and Grandin streets, here.

KITCHENER, ONT.—Ontario Die Co. Ltd. has been incorporated with $40,000 capital and 300 shares no par value to manufacture engines and machinery by Jacob M. Levene, Kitchener.

TORONTO, ONT.—Permite Products of Canada Ltd. has been incorporated with 500 shares no par value to manufacture industrial products, by Graham T. Evans, Toronto.

New Trade Publications

QUENCHING OIL—In its current issue of *Lubrication* the Texas Co., New York, discusses the use of oil as a quenching medium in heat treating. Illustrations and diagrams supplement the text. Requirements of a quenching oil and methods of purification are treated.

WIRE ROPE—American Cable Co. Inc., New York, is circulating a booklet on preformed wire rope. Each reason given for superiority of this rope is illustrated and much information as to the handling and use of wire rope is included.

REFRACTORIES — Laclede-Christy Clay Products Co., St. Louis, in a current bulletin announces its new refractory product, Mullite, for which superrefractory qualities are claimed. The new brick is described and results of tests are given.

ALLOY CASTINGS—Standard Alloy Co., Cleveland, in Bulletin No. 21 describes its standard alloy castings for heat and acid resistance. Various analyses are given, with accompanying data to guide to the proper alloy for a given use.